Elizabeth Dorothy Vincent
from her friend Miss Lebus
Stamford Hill

First ed. 1848

DELESSERIA SANGUINEA

W. Dickes. del

THE

MARINE BOTANIST:

AN

INTRODUCTION TO THE STUDY OF ALGOLOGY,

CONTAINING DESCRIPTIONS OF THE COMMONEST

BRITISH SEA-WEEDS,

AND

THE BEST METHOD OF PRESERVING THEM, WITH FIGURES OF THE MOST REMARKABLE SPECIES.

PORPHYRA LACINIATA. p. 13

W.Dickes del.

BY ISABELLA GIFFORD.

LONDON:
DARTON AND CO., HOLBORN HILL.
BATH: BINNS AND GOODWIN.

"For love of nature dwells not in the heart
Which seeks for things beyond our daily ken,
To bid it glow. It is in common life,
In objects most familiar, we find
Exhaustless matter for our privilege,
Our glorious privilege of reading God,
Amid his bright creation."

L. A. Twamley.

PREFACE.

THE object of this little Work is to afford to those who are desirous of studying the marine Algæ, short and scientific descriptions of the commonest kinds, given in as simple words as possible. The generic characters are mostly taken from Dr. Harvey's excellent "Manual of the British Algæ," to which this work may be considered as an introductory volume, as it contains explanations of the scientific terms, and an easy introduction to the study of this often neglected but exceedingly beautiful group of the Cryptogamic or flowerless plants.

The short comparative analysis of the classification that I have drawn up, in order to present at one view the distinctive characteristics of the tribes

and genera, will, I trust, facilitate the student's knowledge of the classification; when, by contrasting the characters, he has determined the genus, reference can be made to the fuller generic and specific descriptions given in another part of the Work. I have also appended short analytical descriptions of the species contained in the undescribed genera, which will, I believe, be found useful when the reader can find no description which corresponds with the plant under his notice. He can then refer to the Appendix, which, if not sufficient to determine the specific name of the plant, will at least impress its peculiar characteristics, in its recent state, more fully on the mind; so that when an opportunity occurs of referring to more copious works on the subject, the student will be enabled to recognise and determine the species with little or no difficulty.

In concluding these remarks, I beg to offer my sincere acknowledgments to my Friends and Subscribers who have encouraged this undertaking, and to express the hope that the readers of this little volume may derive the same pleasure I have

myself experienced from the contemplation and study of these varied and delicate examples of the ocean's vegetation.

The pages of the Great Book of Nature lie open before our eyes; and he who attempts, with an earnest and persevering spirit, to read but a few lines from thence, will see the Almighty Power alike evident in the smallest and in the greatest of His works—will see in all things the beautiful order and regularity that rule alike o'er the immense planet and the lowliest plant.

I. G.

LIST OF PLATES.

PLATE III.

PLATE IV.

PLATE V.

PLATE VI.

ANALYSIS OF THE CLASSIFICATION SERIES.

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1 { Plants marine (except one genus *Trentepohlia*) of a red colour. Rhodospermeæ.
Plants of a green colour . . . 2

2 { Plants of an olive green colour, growing in the sea. Melanospermeæ.
Plants of a grass green, rarely purple or red colour, growing either in the sea, in fresh water, or in damp situations. Chlorospermeæ.

SERIES I. MELANOSPERMEÆ.

1 { Marine plants of an olive brown or blackish green colour, changing to black in the air 2
Marine plants of an olive green or yellowish green colour . . . 3

2 { Plants of a leathery or woody substance, mostly furnished with air-vessels, and of a large size. Fucoideæ.
Plants of a cartilaginous texture, and minute size. Lichineæ.*

3 { Plants of an olive green colour, membranaceous 4
Plants either flaccid, cartilaginous, or gelatinous 5

4 { Frond not reticulated. Laminariæ.
Frond highly reticulated. Dictyoteæ.

5 { Frond flaccid, or cartilaginous; not gelatinous 6
Frond gelatinous and filiform, except in Corynephora, which is tuber-shaped and hollow, without gelatine. Chordarieæ.*

6 { Frond filiform, inarticulate. Sporochnoideæ.
Frond filamentous, often capillary, jointed. Ectocarpeæ.

SERIES II. RHODOSPERMEÆ.

1 { Plants of a red colour, and more or less gelatinous structure. Fructification, consisting of clusters, or globules, of minute red seed 2

1 Plants of a red colour and cellular texture, when gelatinous mostly constricted, as if jointed. Fructification, generally of two kinds 3

2 Frond consisting externally of coloured, whorled, filaments, lying in a loose jelly. Fructification, minute red seeds imbedded among these filaments, to which they are attached. Gloiocladeæ.*

Frond, consisting externally of a coat or membrane. Fructification, minute red seeds, imbedded in the internal substance of the frond. Gastrocarpeæ.

3 Plants of a dull, dark purplish colour, and fleshy substance. Frond cylindrical, dichotomous 4

Plants of a rose red, purple, or reddish browncolour, and cartilaginous, membranaceous, leathery or flaccid substance, cellular structure.*

Frond either flat, leafy, compressed or cylindrical, filiform or filamentous . 5

4 Root scutate. Spongiocarpeæ.*

Root creeping. Furcellarieæ.*

5 { Frond inarticulate. Florideæ.
Frond jointed. Ceramieæ.

SERIES III. CHLOROSPERMEÆ.

1 { Plants filamentous articulate, without defined gelatine, growing in the sea or in fresh water. Ulvaceæ.
Plants inarticulate, growing either in fresh water, or on damp ground . . 2

2 { Plants of a membranaceous, hyaline substance, filled with a green granular matter. Fructification, consisting of a granular mass, contained in external vesicles. Siphoneæ.*
Plants of a membranaceous or gelatinous substance. Fructification, minute green or purple granules, either scattered through the frond, or arranged in fours. Conferveæ.

Note.—For descriptions of the Tribes marked thus *, see the Appendix.

N.B. "O. S." is used as an abbreviation for the words, Other Species.

INTRODUCTION

TO THE STUDY OF MARINE BOTANY.

The marine Algæ, or Sea-weeds, are flowerless plants, the growth of that

> "Majestic main,
> A secret world of wonders in itself."

Their structure in many instances is exceedingly simple, consisting in some species of strings of cellules loosely adhering together; others present the appearance of branched threads, which in those kinds of a more perfect structure are joined together and form the stem and branches. In the higher tribes many kinds possess distinct stems and leaf-like fronds, resulting from a membranaceous expansion of the stem, which continues its course

through the frond, and assumes the character of a midrib or vein, (presenting in this instance, a manner of growth nearly analogous to that of the fronds of Ferns.) At a later period what constituted originally the midrib of the frond becomes a branch, as in Delesseria. Many Algæ are parasitical on the larger species, others have knob-like, flat leather-like or fibrous roots, by which they adhere to rocks, stones, shells, and other substances. It is doubted whether they derive any nourishment from these roots, which seem to partake more of the character of clasping fibres or tendrils than of a true root. The fructification of the Algæ is in general very minute, requiring the aid of a good microscope for its detection. It either consists of wart-like minute bodies termed *capsules*, or of spots variously disposed in, or on the surface of the fronds, called *granules;* the spots in which the granules are placed are termed *sori.* Some plants bear both these kinds of fruit; when such is the case, the *capsules* are described as the *primary* and the *granules* as the *secondary* fruit. This is done for greater clearness

in the descriptions, and is not intended to convey the idea that one form is of more importance than the other, as both the seeds (*sporules*) contained in the *capsules* and the *granules* are each alike capable of producing a new plant. Many species of Fucoideæ are furnished with air-vessels, which float them in the water. In the Fucus vesiculosus these vesicles arise within the substance of the frond; while in the curious Sargassum bacciferum, or Gulf-weed, they are currant-shaped, and borne on short stalks. This was the species encountered by Columbus when entering the Gulf of Mexico: it is generally found floating in vast masses, quite unattached to any other substance. This and another species of the same genus are occasionally thrown after violent storms on our Atlantic coasts, but neither kinds are natives of our seas. The name Sargassum is derived from the Spanish *Sargazo*, a term applied to the floating masses of sea-weed that occur in some latitudes. This plant is called by the French, Raisin des Tropiques, probably from the form and abundance of the air-vessels.

Similarity of colour in marine plants is a characteristic feature that often accompanies plants of an allied structure. Thus the olive-green series (Melanospermeæ) contains plants of the most perfect structure and largest size. The red series (Rhodospermeæ) are remarkable for the delicacy of their tissue, and for possessing a double system of fructification, that is, producing both *capsules* and *granules*. While the grass-green series (Chlorospermeæ) possess the simplest structure, and their *seeds* at certain periods are endowed with a singular power of locomotion; whether voluntary or not, is still a matter of dispute amongst botanists.

Though the colour may often serve as an index whereby to determine the series, &c., to which a species belongs, the young student must be careful not to trust too implicitly to this guide, taking care to collect such plants as grow in a favourable situation for the development of their natural hues. Many of the red series, when growing in unfavourable situations, assume a yellowish green or whitish colour. "Laurencia pinnatifida," Dr. Harvey ob-

serves, "is particularly variable in this respect. When this species grows near low water-mark, it is of fine, deep, purple-red; a little higher it is a dull purple-brown; higher still, a pale brownish-red; and, at last, near high-water mark, it is often yellowish or greenish. Chondrus crispus too, when found in shallow water, is often of a bright herbaceous green; and Ceramium rubrum passes through every shade of red and yellow, and at last degenerates into a dirty white before it ceases to grow. All these species vary in form and size as they do in colour, and the various anomalous shapes that they assume are almost sure to deceive a young botanist into the belief that the varieties are so many different species." The Cystoseira ericoides, when seen growing under water, appears clothed in the most beautiful rainbow hues, but when removed from the water is found to be of a dark olive-green: a few others possess this remarkable property, which is termed iridescent.

In enumerating the different uses of Sea-weed, its importance to the various animals inhabiting the sea

first claims attention. Innumerable animalculæ, which form the principal food of the whale and of many species of fish eaten by man, derive their sustenance from the Algæ, which is as necessary to them as the vegetation of the land is to the different living creatures upon it. Thus

> "Huge ocean shows, within his yellow strand,
> A habitation marvellously planned,
> For life to occupy."

The following observations made by Capt. Grey,* during the course of his homeward voyage from Australia, are interesting in connexion with this subject, and also as relating to animals of whose habits and means of existence we have from the nature of the element they inhabit but little acquaintance. Captain Grey says: "In 26° N. lat. we entered a portion of the sea covered with patches of sea-weed, around which swarmed nume-

* See Capt. Grey's "Australia," (voyage homewards.) Nat. Hist. p. 176.

rous eel-like fish, crabs, shrimps, and little blue fish. These last swam under those floating islands, sometimes leaving them for a little distance, but they always returned or swam to another: the crabs crawled in and out amongst the sea-weed, and other fish of a large size came to these spots to deposit their spawn; so that we were in an archipelago of floating islands, teeming with busy inhabitants and animal enjoyment. Aug. 30th, a pine tree passed us, covered with barnacles, and surrounded by fish, which swam about this floating island, eating such things as fell from it. No portion of the globe is more thickly inhabited, or affords, in proportion to its size, a greater amount of animal enjoyment than did this wave-tossed isle. On it were innumerable barnacles, several species of teredo, one of which, having its head shaped like a screw divided into two equal portions, I believe to have been quite new. Many varieties of crabs and minute insects, shaped like a slug, fed on the sea-weed growing on the log." A description which reminds one forcibly of that given by

Milton, in his account of the Creation, where he says :—

"Forthwith the sounds and seas, each creek and bay,
With fry innumerable swarm, and shoals
Of fish, that with their fins and shining scales
Glide under the green wave, in sculls that oft
Bank the mid sea : part single, or with mate
Graze, the sea-weed their pasture, and through groves of coral stray."

The Fucus vesiculosus affords excellent winter provender for cattle. Turner says : "In the islands of Jura and Skye they regularly feed upon it during winter." It is the *Küe-tang* of Norway, and cow-weed of the north-west of Scotland, and the west of Ireland : in Gothland, the people boil it with coarse flour, and feed their pigs upon it, whence they call it *swine-tang*. Dr. Drummond observes, that "it is much used by the poorer classes about Larne (near Belfast) for feeding pigs. Boiling water being poured upon it, which softens and renders it glutinous, it is then mixed with greens or potatoes, or even given by itself. Many persons have

assured me that the pigs are not only very fond of it, but that they thrive upon it remarkably well.'' Fucus serratus is also used as winter provender in some northern countries; and in Norway is called *bred-tang*, being given to the cattle, sprinkled with meal.

During the late severe winter (1847), many of the poor along the western and north-west coasts of Ireland subsisted almost entirely upon sea-weed, probably the *dulse* Rhodomenia palmata, which is by far the most abundant edible species: it is the *dulliosg* of the Highlanders, and *dillish* of the Irish. After being soaked in fresh water, it is eaten either boiled, or dried, and in the latter state has something of a violet scent and flavour. Iridæa edulis is also eaten by the poor, either raw, or cooked in the frying-pan. Alaria esculenta is said to be much eaten in Scotland, and frequently exposed for sale in the markets, along with the young fronds and stems of Laminaria digitata and saccharina. The two species, Chondrus crispus and mamillosus, constitute the *Carrageen*, or *Irish Moss*, which when

bleached white and boiled into a jelly, forms a nutritious food for invalids and delicate people. When properly prepared, it is nearly as agreeable to the taste as calf's-foot jelly or blanc-mange. Porphyra laciniata and vulgaris are sold under the name of *Laver* in England, *Sloke* or *Slokaun* in Scotland and Ireland; it is eaten after being well boiled, when it forms a favourite vegetable with many persons. In Wales it is fried with oatmeal, and brought to table under the name of *Laver bread;* this, I am informed, is very palatable, and is a dish much relished by those who are accustomed to eat it. But of all those used for food, Dr. Harvey says, "Gigartina lichenoides, an East Indian species, resembling our G. compressa, which, if as abundant, would be equally valuable, deserves the first rank. This, under the name of *Ceylon Moss,* is much used in the East as a nutritive article of food, and for giving consistence to other dishes. It is of a very gelatinous nature, and when boiled down is almost wholly convertible into jelly, which is of a purer nature than that obtained from our Chondri. Large quantities are

annually sold. The famous *edible nests* of China, the finest of which sell for their weight in gold, are constructed by a species of swallow from some undetermined plant of this genus, allied to G. lichenoides."

As a manure, Sea-weed is much valued by the dwellers along many of our seashores. A lady resident on the Norfolk coast, informs me that she has found it "capital manure for most garden plants, and that it is quite as good for forcing Sea-Kale by Christmas, as stall litter, the only care necessary is not to let it heat *too* fast." In the Channel Islands, the "*vraicking*," or sea-weed harvest, presents a picturesque and busy scene; along the beach of some large bay, at low water, numbers of people may be seen busily engaged, either in collecting the *vraic* into heaps, filling their carts, or loading their boats with it, which they do to such an extent as to sink them nearly to the water's edge; allowing only sufficient space in the centre of the load for a man to place himself in, who, when seated in the midst of this mass of sea-weed, looks not unlike an Esquimaux pad-

dling along in his skin-clad boat, with his head alone visible.

From plants of the Fucoideæ tribe *kelp* is obtained, which is an impure carbonate of soda. According to Dr. Harvey, "It is prepared by merely burning the weeds, previously dried in pits dug along the shore, till they are reduced to hard dark-coloured cakes, in which state it is sent to market." Kelp is employed in the manufacture of glass, and for the purpose of soap-boiling. Fucus vesiculosus is by far the most productive kind; from five ounces of the ashes, it is said, may be procured two ounces and a half of fixed alkaline salts. Iodine, a valuable medicine in diseases of the glands, is obtained exclusively from plants of this family. The mucilaginous receptacles of Fucus vesiculosus I have seen in France, when soaked in brandy, applied as an external remedy in cases of sore throat; probably the beneficial effects arise from the presence of Iodine, which is supposed to exist principally in the mucus of these plants. In the Channel Islands, the same species, with other kinds of Fuci, after being dried is used as fuel; also for

smoking bacon and fish, to which it communicates a most peculiar flavour. Having noticed the most important uses of these plants, it would be a matter of little interest to the reader were I to detail the minor uses to which they are applied. Nor is it necessary for me to dilate upon their varied hues, and often singularly beautiful forms, which, by the Botanist and true lover of nature, can never be viewed without admiration and pleasure.

SERIES I.

MELANOSPERMEÆ:

OLIVE-GREEN SERIES.

"PLANTS of an olive-green or olive-brown colour, and cellular or filamentous structure; growing in the sea. *Fructification* contained in definite capsules or receptacles, or in distinct sori. *Seeds* dark-coloured."

HARVEY.

THE Sea-weeds in this series are most frequent about half-tide level; when growing in deep water, they become either of a brown or nearly black colour. They grow to a large size, and are of more

perfect structure than those contained in the two succeeding series.

FUCOIDEÆ. FUCUS TRIBE.

Plants growing in the sea of an olive-brown colour, turning to black when dry, their substance leathery or woody. Fronds flattened or hair-like, or forming distinct leaves; many of the species bearing air-vessels. *Fructification:* seeds contained in distinct gelatinous receptacles.

The sea-weeds contained in this tribe are of a rigid, woody, or leathery texture, not adhering to paper. Many of the species are found growing in pools among the rocks when the tide is out; then may be noticed the varied and beautiful hues of the Cystoseira ericoides, as its branches wave to and fro in the clear water. Halydris siliquosa, with its black shiny leathery branches. All the

species of Fuci, and the curious Himanthalia lorea, or Sea-thongs, (which English name well describes its general appearance,) may be met with on any of our rocky sea coasts.

GENERA OF THE FUCUS TRIBE.

Cystoseira. Air-vessels in the branches. Receptacles small.

Halydris. Air-vessels stalked, long, pod-shaped.

Fucus. In those species which bear air-vessels, these latter are situated in the frond. Receptacles large, seeds contained in the mucus.

Himanthalia. Frond round, small. Receptacles resembling fronds, very long, and branched.

CYSTOSEIRA.

Name signifying a chain of air-vessels.

"FROND much branched, occasionally leafy at base; *branches* becoming more slender upwards,

and containing strings of simple air-vessels within the substance. *Receptacles* small, terminal."

HARVEY.

CYSTOSEIRA ERICOIDES.—HEATH-LIKE CYSTOSEIRA.

A RIGID and very bushy sea-plant, thickly set with small spine-like ramuli, or leaves; the air-vessels are small, and mostly solitary in the upper branches. Colour, olive-green; but when seen growing under water appearing clothed in the most beautiful iridescent hues. This, and the two following species, will require, when dried, to be gummed on another piece of paper, as they do not adhere to the paper on which they are spread. C. ericoides grows on rocky coasts; it is common along the shores of Devon and Cornwall, and the western and southern coasts of Ireland. Yarmouth Beach, Bill of Portland, Torquay, Falmouth, very common. Marazion, Penzance, Bantry Bay, Port Rush, North of Ireland.

1. CYSTOSEIRA FIBROSA. p. 19.
2. HALYDRIS SILIQUSA. 21.
3. DESMARESTIA LIGULATA. p. 34.
4. DYCTYOTA DICHOTOMA. 39.

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CYSTOSEIRA GRANULATA.—GRANULATED CYSTOSEIRA.

The branches of this plant are slender and much divided, with hard knob-like substances at the base of each; this latter character sufficiently distinguishes it from the former species. The air-vessels are placed two or three together in the upper branches. Grows in rocky pools left by the tide on the south-coasts of England and Ireland, not uncommon. Coast of Devon; Falmouth, and other places on the Cornish coast. Bantry Bay, Youghal, Magilligan, co. Derry, Larne. Growing in pools at Ardglass, co. Down.

CYSTOSEIRA FIBROSA.—FIBROUS CYSTOSEIRA.

Very bushy, branches densely clothed with narrow flat leaves. Air-vessels mostly solitary, situated in the branches and remote from the tips,

larger than in the other species. Colour, dark green; black when dried. Not very common. Southern coasts chiefly. Shores of Yorkshire, Lancashire, and Hampshire; Yarmouth, rare. Devon, Falmouth, and on the Cornish coast, frequent. West of Ireland, shores of Antrim, Portrush.

O. S. C. fœniculacea, Fennel-like Cystoseira. Found on the south and south-west shores of England and Ireland.

HALYDRIS.

Name signifying sea-oak.

"*Frond* compressed, coriaceous, linear, pinnated with distichous branches. *Air-vessels* lanceolate, stalked, divided into several cells by transverse septa. *Receptacles* lanceolate, stalked, compressed."

GREVILLE, IN HARVEY.

HALYDRIS SILIQUOSA.—POD-BEARING HALYDRIS.

The fronds of this plant are tough and leathery. The air-vessels are long, flattened, pod-shaped bodies, growing on the upper branches. Colour, dark olive ; black when dried. Frequent on rocky shores. Var. β Minor is smaller in every part, and with fewer air-vessels ; is found in shallow pools left by the tide, on the coast of Cornwall, and elsewhere.

FUCUS.

Name signifying Sea-weed.

"*Frond* plane, compressed, or cylindrical, linear, dichotomous (rarely pinnated), coriaceous. *Air-vessels,* when present, innate in the frond, simple, large. *Receptacles* terminal (except in F. nodosus), turgid, containing tubercles immersed in mucus and discharging their seeds by conspicuous pores.

GREVILLE, IN HARVEY.

FUCUS VESICULOSUS.—BLADDER FUCUS, BLADDER WORT.

Fronds with a midrib. Air-vessels large, round, mostly in pairs. Receptacles large, swollen, filled with mucus. Substance tough. Colour, dark-green. Very common on rocky shores. "This plant is extensively used in the manufacture of *kelp*, and furnishes besides excellent winter food for the cattle in the western islands of Scotland."

FUCUS SERRATUS.—TOOTHED, or SERRATED FUCUS.

Frond with a distinct midrib, divided, the margin regularly toothed ; without air-vessels. Receptacles flat, terminal. Substance leathery ; colour, dark olive-green. Rocky coasts, common.

FUCUS SERRATUS. p. 23.

W. Dickes del.

FUCUS CERANOIDES.—LESSER FUCUS.

Frond with a midrib, smaller and more delicate than the last, without air-vessels. Receptacles at the extremities of the fronds. Grows on rocky sea-shores. Not so common as the last. Christchurch, Hants; Torquay, Devon; Falmouth, Cornwall.

FUCUS NODOSUS.—KNOTTED FUCUS.

Stem swelling at intervals into air-vessels. Branches forked, with alternate smaller branches. Receptacles lateral, stalked. Substance tough and leathery. Colour, olive-green. This plant sometimes reaches six feet in length. Grows in rocky pools. Very common.

FUCUS CANALICULATUS.—GROOVED, OR CHANNELLED FUCUS.

WITHOUT air vessels. Receptacles swollen, terminal, divided into two or in pairs. Smaller than the other species; seldom exceeds three or four inches in length, but covers the surface of the rocks for many yards. One side of the stem is convex, the other grooved.

O. S. F. Makaii. Connemara, Ireland; west shores of Scotland; and the Hebrides.

F. tuberculatus, rather rare. Southern shores of England, north of Ireland; west of Ireland, abundant.

HIMANTHALIA.

Name, a translation of the English name "Sea-thongs."

"*Frond* coriaceous, cup-shaped. *Receptacles* elongated, strap-shaped, compressed, repeatedly

forked, springing from the centre of the frond, containing tubercles furnished with a pore.

GREVILLE, IN HARVEY.

HIMANTHALIA LOREA.—SEA-THONGS.

FROND small, round, fixed to the rocks by a most tenacious gluten. The receptacles are very long, regularly forked, and resembling fronds. Dr. Borlase in his Natural History of Cornwall, says he measured a plant twenty-two feet long. The usual length of the receptacles is from two to ten feet. Colour dark olive-green. Common on rocky shores. Falmouth, and Mount's Bay, Cornwall.

LAMINARIÆ.—LAMINARIA TRIBE.

PLANTS in the sea of an olive-green, or olive-brown colour, of a membranaceous or leathery texture. Frond leaf-like, stalked, cleft, and sometimes with a midrib. Fructification: "seeds or

granules in spots or sori, on the surface of some part of the frond."

GREVILLE.

THE sea plants composing this tribe are very different from the Fucoideæ. Their fronds are like large leaves or pieces of ribbon. The genus Alaria is distinguished from Laminaria by its distinct midrib, which is in reality the stem, that continues its course through the frond. The leaflets arise from the middle of the main frond, and are without any veins. Alaria esculenta and many species of Laminaria grow on rocks in the sea in deep water ; their fronds are often of great length ; they mostly adhere firmly to paper. The smaller specimens of L. saccharina and Phyllitis, when perfect and well preserved, so as to exhibit the delicate foldings of their fronds, their soft pale green colour and elegant forms, make them well-deserved favorites with all who have an artist's eye and are admirers of Nature's work. Who would think

"the rough, rude sea" contained such soft and spring-like leaves!

GENERA OF THE LAMINARIA TRIBE.

Alaria. Frond with a distinct midrib.

Laminaria. Frond without a midrib.

ALARIA.

Named from *Ala*, a wing, on account of the winged leaflets.

"*Frond* membranaceous, furnished with a percurrent, cartilaginous midrib, the stem pinnated with distinct leaflets." *Fructification:* "pear-shaped *seeds*, vertically arranged in the thickened leaflets."

GREVILLE.

ALARIA ESCULENTA.—EDIBLE ALARIA. "DABERLOCKS."

STEM thick, winged at the base with flat sword-shaped nerveless leaflets; *frond* very long, pene-

trated through its whole length by the stem, which is visible on both its surfaces, the margin "wonderfully plaited and curled." Dr. Greville says: "The midrib stripped of the membrane, and sometimes the leaflets, are eaten in Ireland, Scotland, Iceland, Denmark, and the Faroe Islands. It is called in Scotland, *Badderlocks*, or, *Henware*, and in the Orkney Islands, *Honey-ware*. Dr. Drummond informs me, that in some parts of Ireland it bears the name of *Murlins*." Grows on rocks and stones in deep water, frequent. Coast of Cumberland, Weymouth, Acton Castle, and other places on the coast of Cornwall. Near Belfast, Bantry Bay, in Ireland, and the shores of Scotland.

LAMINARIA.

Named from *lamina*, a thin plate or substance.

Frond coriaceous (rarely membranaceous,) plane, expanded, without a midrib. *Fructification:* "*seeds* or *granules* forming dense spots, and imbedded

in the thickened surface of some part of the frond."

GREVILLE, IN HARVEY.

LAMINARIA DIGITATA.—FINGER-LIKE LAMINARIA, OR "SEA GIRDLES AND HANGERS."

STEM thick, solid, and woody. It tapers a little at top, and then suddenly expands into a frond of a foot or more in breadth, which is again divided into a number of strap-shaped segments. Root large and fibrous, adheres to rocks and stones in deep water. Colour olive-green, substance of the fronds rathery tough and leathery. This plant when taken out of the water and held by the stem, has been said to resemble a flag-staff and flag; the latter cut horizontally into strips. Common on most coasts.

LAMINARIA BULBOSA.—BULBOUS-ROOTED LAMINARIA, OR, GREAT FURBELOWED LAMINARIA.

FROND long, narrow, undivided when young, but afterwards cleft into many segments. Root hollow, bulbous, throwing out strong fibres, which fix and support the plant. The fronds are sometimes fifteen feet in length. Colour olive-green, with a glossy appearance as if varnished. Frequent in deep water.

LAMINARIA SACCHARINA.—SWEET LAMINARIA. SEA-BELT.

FROND undivided, margin waved. Substance variable; in young specimens thin and delicate, in others tough and leathery. Colour olive-green or yellowish-green. It is said of this species, that washed in spring water and then hung up in a warm place, a substance like sugar exudes from it. May not this plant be the Honey-ware of the Orkney

Islands? The name seems more applicable to this species than to Alaria esculenta. Rocks and stones in the sea, frequent.

LAMINARIA PHYLLITIS.— HART'S-TONGUE LAMINARIA.

Not uncommon, and nearly resembling the last, of which it is probably only a variety. Dr. Harvey remarks: "The more lanceolate form, delicate substance, and pale yellowish-green colour constitute the chief marks of distinction." Weymouth, Torbay, Yarmouth, Tenby, Larne, near Belfast, Bantry Bay, North of Ireland, and Western Islands of Scotland.

O. S. L. debilis. Very rare. Western Islands of Scotland, Larne, North of Ireland, Torbay.

L. fascia. North of Ireland, Carrickfergus, Antrim coast, Sidmouth and Meadfoot, Torbay, St. Michael's Mount, Cornwall.

SPOROCHNOIDEÆ.—SPOROCHNUS TRIBE.

MARINE plants mostly of a yellowish-green colour, much branched; branches leafy or hair-like, soon decomposing on exposure to the air. "In some cases acquiring under such circumstances a verdigris-green colour, and then possessing the property of rapidly decomposing other delicate Algæ in contact with them."

GREVILLE.

"FRONDS at some period of their growth bearing deciduous tufts of bright green filaments."

HARVEY.

FRUCTIFICATION not well known. "Sessile warts or little stalked, club-shaped bodies."

GREVILLE.

A curious property has been noticed in two genera of this tribe, Desmarestia and Elaionema.

"The fresh specimens when spread on paper render it transparent, as if it had been touched with oil. This tribe contains besides Desmarestia, three other genera : Dichloria, containing one species ; D. viridis, which grows on stones and the larger Algæ. The colour in the fresh plant is a rich orange tinged with brown, which is so fugitive, that by a few minutes' exposure to the air, it becomes a light verdigris green. It is never glossy ; substance, rather stiff ; whole appearance beautifully feathery and capillary." Sporochnus contains S. pedunculatus, S. rhizodes and Cabreræ ;* the latter very rare. The genus Elaionema has only one species, E. villosum, the remarkable property of which has been before alluded to.

GENERA OF THE SPOROCHNUS TRIBE.

Desmarestia. Frond flat or compressed ; when young, furnished wtth soft filaments. At a later period the branches bear short spine-like ramuli.

* This species is now named Carpomitra Cabreræ.

In the two species of this genus, D. ligulata and aculeata, no fructification has as yet been noticed.

DESMARESTIA.

Named in honour of A. G. Desmarest, a celebrated French Naturalist.

"*Frond* cartilaginous, plane or compressed, distichously branched; while young, furnished with marginal deciduous tufts of soft green filaments."

GREVILLE IN HARVEY.

DESMARESTIA LIGULATA.—STRAP-LEAVED DESMARESTIA.

FROND with an obscure midrib, repeatedly branched in an opposite manner. "The main stem, about the breadth of a straw. The young plants much like the feathered part of a large quill." Colour, olive-brown while growing, but fades in

the air to a verdigris green ; yellowish when dry. Grows in the sea ; thrown on the shore near Hastings, coast of Northumberland, Yarmouth. Southern shores of England, frequent. Cornish coast ; common also in the Isle of Jersey. Not uncommon on the south and west shores of Ireland. Bantry Bay, plentifully. In Scotland, the Frith of Forth, about New Haven, and other places, Orkney Islands.

DESMARESTIA ACULEATA.—SPINY DESMARESTIA.

Frond narrower than in the preceding species. The branches when young clothed with soft silky fibres, which have the appearance at first sight of a parasitical conferva. When the plant has done growing these fibres fall off, and the branches bear short spine-like ramuli. This species varies from one to three feet in length. Colour, yellowish or dark-green. Frequent on most shores. Coasts of Cornwall, very common.

DICTYOTEÆ.—DICTYOTA TRIBE.

"MARINE plants of an olive green colour, and membranaceous flexible substance, rarely cartilaginous, and scarcely at all juicy, with a highly-reticulated structure." Frond round or flat, simple or branched, without nerves or veins (excepting in Halyseris); often divided in a fan-shaped manner. Fructification: "either in lines, in sori, or covering the whole of the frond; very rarely enclosed in capsules."

HARVEY.

The plants composing this tribe are not marked by any very distinctive feature by which the young botanist may recognise them; therefore the character given of the tribe must be carefully studied. We remark "the plants are of an olive-green colour, and membranaceous;" so are some of the Laminariæ. Then the difference must consist in the "flexible substance and highly reticulated structure" possessed by this tribe. The last character is, however, not observable unless under a

high power of the microscope. Those genera not described are Cutleria, containing one species only, C. multifida, very rare; found at a few places in England and Ireland. Halyseris contains but one species, H. polypodioides: Torquay, and several places in the south of England. This is the only plant of the Dictyota tribe that possesses a midrib. Padina comprises three species; P. Pavonia, Turkey-feather, Padina: met with on rocks along the extreme southern shores of England; Torquay, and several places, rare. P. ? deusta is a doubtful species, and P. parvula a rare one: Sidmouth and Miltoun Malbay. The genera Dictyosiphon and Striaria have only one species in each. D. fœniculaceus, with slender hair-like branches, of a yellowish or brown colour, not uncommon on the western shores of Scotland, and frequent on the Irish coasts. S. attenuata grows on other Algæ; rare.

GENERA OF THE DICTYOTA TRIBE.

Dictyota. Frond forked, or variously cleft.

Punctaria. Frond a flat leaf, undivided.

Asperococcus. Frond not branched, a "cylindrical or compressed tube."

Chorda. "Frond long, string-like, cylindrical, furnished at intervals with internal septa" (partitions).

DICTYOTA.

Name signifying a *net;* from the reticulated structure of the frond.

"*Root* a mass of woolly filaments. *Frond* flat, highly reticulated, membranaceous, dichotomous, or irregularly cleft (palmate and slightly fan-shaped in D. atomaria). *Fructification;* composed of scattered or variously aggregated, somewhat prominent seeds, on both surfaces of the fronds."

GREVILLE, IN HARVEY.

DICTYOTA DICHOTOMA.—CLEFT DICTYOTA.

Fronds regularly cleft, tapering gradually to the end. Colour, olive-green; substance, membranaceous; adhering to paper, which it often contracts in drying; this arises from the fronds shrinking, and can scarcely be avoided. When the paper is much drawn up, a narrow slip may be cut out, the edges of the paper drawn together, and gummed. This will make the specimen flat, and allow of its being fixed in the herbarium. A variety of this plant, β. intricata, with the fronds narrow and curiously twisted, is not uncommon. Grows on rocky shores frequent.

O. S. D. atomaria, marine rocks, rare. Cromer; coast of Devon; Worm's Head, Glamorganshire; Sussex; Ballycotton, coast of Cork.

PUNCTARIA.

Name from *punctum*, a dot: descriptive of the dotted fructification.

"FROND simple, membranaceous, with a naked scutate root. *Fructification* scattered over the whole frond in minute distinct spots."

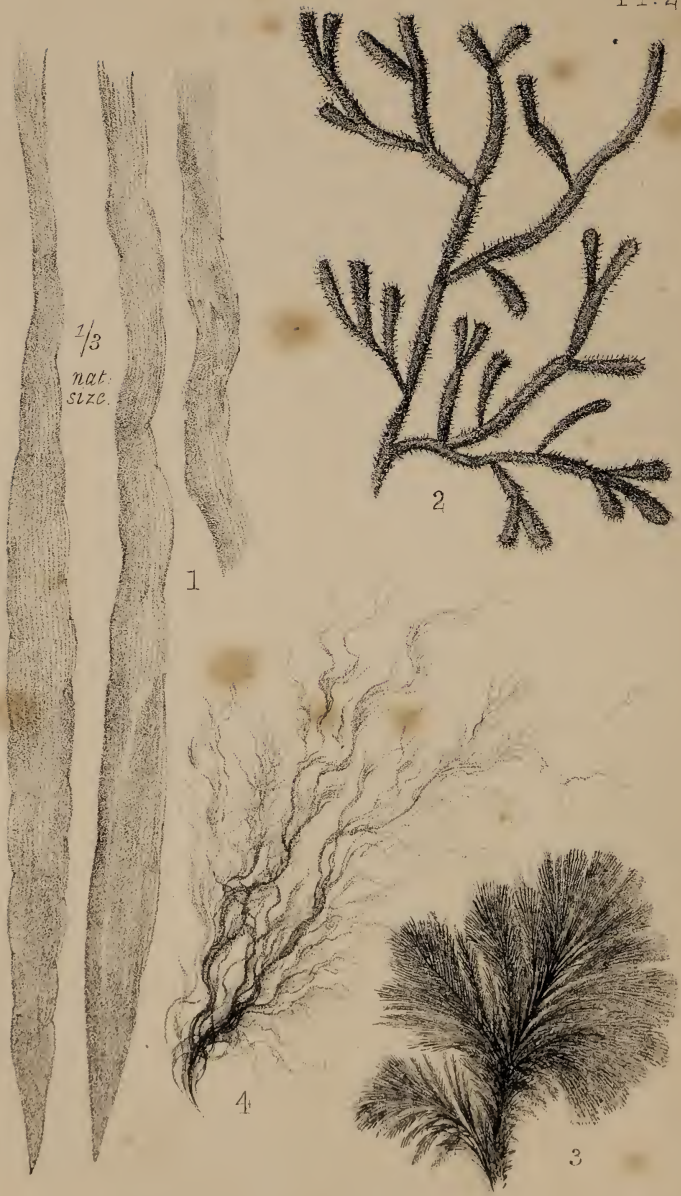
GREVILLE, IN HARVEY.

PUNCTARIA LATIFOLIA.—BROAD-LEAVED PUNCTARIA.

"FROND generally tufted, wide, oblong or lanceolate, flat or curled, delicately membranaceous and semi-transparent; somewhat gelatinous, of a pale olive-green colour."

HARVEY.

Rocks in the sea; Sidmouth and Torquay; near Belfast; West of Ireland.



1. PUNCTARIA PLANTAGINEA. p. 41 | 3. SPHACELARIA SCOPARIA. p. 48.
2. CLADOSTEPHUS VERTICILLATUS. 47 | 4. ECTOCARPUS LITTORALIS. 51.

W. DICKES. LITH.

PUNCTARIA PLANTAGINEA.—PLANTAIN-LEAVED PUNCTARIA.

Frond tough, leathery, tapering at base. Colour dull olive-brown. "*Dots* of fructification oblong, larger than in the preceding species, from which this character, with the thicker substance and darker colour, serve to distinguish it." Not uncommon ; attached to rocks and some of the larger Algæ. Various places on the south and eastern coasts of England and Ireland ; Cromer, Southwick, Sussex ; Falmouth, and Mount's Bay, Cornwall ; Belfast ; Frith of Forth.

O. S. P. tenuissima. In the sea ; parasitic on Zostera marina. Fronds delicate, "fringing the plant on which they grow." Bute, Appin.

ASPEROCOCCUS.

Name signifying *rough seed.*

"*Frond* simple, tubular, cylindrical, or (rarely) compressed, continuous, membranaceous. *Root*

minutely scutate, naked. *Fructification:* distinct spots composed of imbedded seeds, mixed with erect club-shaped filaments."

GREVILLE, IN HARVEY.

ASPEROCOCCUS ECHINATUS.—ROUGH ASPEROCOCCUS.

A very variable plant. In the var. β vermicularis, the fronds are slender, and very much twisted. It varies from two inches to two feet in length. The fronds are narrow, soft, rather tapered at base, and frequently completely covered with the fructification, which appears in crowded *dots* on the surface. Colour, olive-brown. Substance soft, adheres firmly to paper. Rocks in the sea; common, β vermicularis. Torquay, Falmouth.

O. S. A. compressus. In the sea, rare. Sidmouth and Torquay, Long Rock, Mount's Bay.

A. Turneri. In the sea, on stones and the larger

Algæ, rare. Coast of Sussex and Devon ; Bantry Bay ; "The Murough," near Wicklow ; Strangford Lough ; Appin, Scotland.

A. ? pusillus. In the sea ; parasitical on Chorda filum. Torquay, Falmouth Bay, Long Rock, Mount's Bay, Ballycotton, coast of Cork, coast of Down, Kilkee, co. Clare, Appin, and Bute, in Scotland.

The fronds of this species do not exceed four inches in length, and are about the thickness of coarse thread, so closely set on the plant on which they grow, as to give it "the appearance of a little brush."

CHORDA.

Name Chorda, a Cord.

"*Frond* simple, filiform, cylindrical, with an interrupted cavity. *Root* naked, scutate. *Fructification:* external continuous masses of pear-shaped seeds, fixed by their base."

GREVILLE, IN HARVEY.

CHORDA LOMENTARIA.—CONSTRICTED CHORDA.

Fronds constricted at intervals, as if tied; slightly inflated. Varying from three to sixteen inches in length, not half an inch in breadth; narrower at each end. Substance, soft. Colour, brownish olive. Grows on rocks and stones in the sea; not uncommon.

CHORDA FILUM.—STRING-LIKE CHORDA.—"SEA LACES."

Fronds very long; horny, without external constrictions. "From one to twenty feet in length; dark olive, shiny; covered with pellucid, hair-like fibres. Fructification covering the surface of old fronds."

Harvey.

This plant at low water may be observed in

great masses, the fronds floating just below the surface of the water. Grows on rocks and stones; common.

ECTOCARPEÆ.—ECTOCARPUS TRIBE.

"PLANTS marine, of an olive-green, or (rarely) a full green colour; filamentous, often capillary or cobwebby, jointed; cartilaginous, or flaccid, not very juicy."

HARVEY.

Fructification two sorts. 1st, seeds in capsules; 2nd, "granules imbedded in the distended, often colourless, tips of the ramuli."

This tribe contains species differing from one another in their substance, but of the same structure, and agreeing in their mode of fructification.

Cladostephus and Spacelaria are too firm and rigid in their texture to adhere to paper; while Ectocarpus contains species soft and smooth as floss silk. The next genus, Myriotrichia, which is omitted, comprises two species, small and parasi-

tical, on Chorda lomentaria, M. clavæformis, and filiformis.

GENERA OF THE ECTOCARPUS TRIBE.

Cladostephus. Stem not articulated, branched. The ramuli set in whorls.

Sphacelaria. "Stem jointed, branched, distichous, pinnated, rigid."

Ectocarpus. Stem capillary (hair-like), generally much branched, flaccid, jointed.

CLADOSTEPHUS.

Name meaning a *branch* and a *crown.*

"*Main filaments* cartilaginous, rigid, inarticulate, whorled with short, articulated, sub-simple ramuli. *Fruit,* two-fold : 1, ovate *capsules;* 2, *granules* imbedded in the tips of the ramuli."

HARVEY.

CLADOSTEPHUS VERTICILLATUS.— WHORLED CLADOSTEPHUS.

Much branched ; the branchlets mostly forked. The whole set with close whorls of fine short hair-like fibres, which curve inwards. Colour, dull olive-green. Grows attached to rocks and corallines ; frequent. Coasts of Cornwall, very common.

CLADOSTEPHUS SPONGIOSUS.— SPONGY CLADOSTEPHUS.

The branches of this plant are so thickly set with short bristle-like fibres as to make it appear, when first taken out of the water, like a piece of wet sponge. Colour, dull-brown or green. Substance, thick. This and the preceding will require to be gummed on the paper on which they are intended to be preserved. Grows on rocks, stones, and corallines ; common.

SPHACELARIA.

Name referring to the *withered* tips of the fertile branches.

"*Main filaments* jointed, rigid, distichously branched, pinnated, rarely forked or simple. *Fruit* twofold, on the same individual: 1, roundish-ovate *capsules;* 2, a dark, granular *mass,* inclosed in the colourless distended tips of the branches and ramuli."

HARVEY.

SPHACELARIA SCOPARIA.—BUSHY SPHACELARIA.

STEM at the base shaggy, in the upper part branched in a pinnate manner; "the pinnæ either short and spine-like, or long and again pinnate." The height of this plant varies from two to five inches. Colour, dark olive-green. Substance harsh and rigid. On rocks, stones, and corallines. Southern coasts of England, frequent; Torquay, Falmouth,

very common. Irish coast in several places, but not frequent. Frith of Forth, Scotland.

SPHACELARIA CIRRHOSA.—TUFTED SPHACELARIA.

A VERY variable species, without shaggy fibres at the base, tufted, branched. In the var. β. ægagropila, the branches are thickly set with spine-like pinnæ, "forming a dense round ball." This variety is very common at Falmouth, and West of Ireland.

γ. patentissima, "ramuli irregular, issuing at right angles." Shores of Bute. Substance of S. cirrhosa, rigid. Colour, greenish-brown. On Algæ and on corallines, very common.

O. S. S. filicina, very rare. A delicate pinnated species. Plymouth, Ilfracombe, Salcombe, St. Agnes, on the north coast of Cornwall, and Long Rock; Mount's Bay, very sparingly. Var. β. patens, at Brighton. Whitsand Bay, Belfast Bay, Kinsale Harbour.

S. plumosa. South coasts of England; near Caernarvon, North Wales. Wicklow, Belfast Bay, Frith of Forth.

S. fusca. Shores of Wales; Sidmouth; St. Michael's Mount, Cornwall.

S. radicans. In the sea, on sand-covered rocks, in various parts of Great Britain and Ireland. Torquay; St. Michael's Mount, Cornwall; Bantry.

S. olivacea. On marine rocks; Orkney, Appin, Dunmore, Ireland.

S. racemosa. Frith of Forth.

S ? velutina. Sidmouth, Mousehole, near Penzance, Appin.

ECTOCARPUS.

Name signifying *external fruit.*

"*Filaments* capillary, jointed, olivaceous or brown, flaccid, without longitudinal striæ (marks). *Fruit: capsules* and granules in swollen ramuli."

HARVEY.

ECTOCARPUS LITTORALIS.—SHORE ECTOCARPUS.

Branches entangled together, filaments fine and thread-like. Substance flaccid, but not gelatinous. Colour, brownish-green or olive. Common on the larger Algæ, and on rocks, appearing like tufts of fine brown wool.

ECTOCARPUS TOMENTOSUS.—SPONGY ECTOCARPUS.

Fronds spongy, "composed of a dense mass of slender filaments, intricately woven together." Plant irregularly branched, of an olive-green or brownish-green colour. Not uncommon on rocks and the larger Algæ. This and the preceding species are very unlike, and may easily be distinguished from each other; the remaining species of this genus are either very rare, or so nearly resemble

others in their general appearance, as to be only distinguishable by minute characteristics, that in this, as well as in some of the succeeding genera, many species, not uncommon, have been omitted, under the belief, that a short and necessarily imperfect description of such plants would tend more to involve the young student in difficulties than to elucidate them.

O. S. E. siliculosus, not uncommon, and very like E. littoralis, but the *capsules* are pod-shaped, whence the specific name: these latter are discernible only under a higher power of the microscope.

E. fasciculatus, on the larger Algæ. Torquay, Mount's Bay, Mangan's Bay, co. Waterford, Strangford Lough, on Zostera.

E. Hincksiæ, parasitical on the larger Algæ, Mount's Bay, plentiful on the stems of Laminaria bulbosa. Ballycastle.

E. crinitus. Watermouth, Devon. Appin.

E. pusillus. Torquay, Land's End, St. Michael's Mount.

E. distortus. Appin on Zostera.

E. granulosus. South coast of England, frequent. Bantry Bay, shores of Cork.

E. sphœrophorus. Parasitical on other Algæ. Sidmouth, and Torquay, Mousehole, and Sennen Cove, Cornwall. Bantry Bay, Ireland. Appin, Scotland.

E. brachiatus. Coast of Norfolk. On R. palmata at Torquay and Mount's Bay.

E. Mertensii. A beautiful and rare species, with slender branches, not entangled, bearing spreading ramuli. Colour olive-green. This plant in its branching is not unlike a Sphacelaria. On the sea-coast of Durham. On the beach at Yarmouth, Sidmouth, and Torbay. Marazion, beyond the Mount, Cornwall. Strangford Lough, Ireland.

SERIES II.

RHODOSPERMEÆ.

RED SERIES.

"*Plants* marine, (except the genus Trentepohlia,) of a rose-red, purple, or red-brown colour, leafy, cylindrical, or filamentous. *Fructification* mostly double; the primary contained in capsules, receptacles, or immersed in the frond; the secondary, (when present) minute granules forming sori, or imbedded in distinct receptacles. *Seeds* red or red-brown."

HARVEY.

THE sea plants forming the red series, thrive and sasume their richest hues in deep water; in shallow

pools they never attain their full and natural colour, but degenerate to a greenish or yellowish-white. This is particularly remarkable in L. pinnatifida, C. crispus, and Ceramium rubrum. The double system of fructification and delicately membranaceous, leaf-like, or variously-divided fronds, of a red or pinky hue, soon decomposing in fresh water, form the main characteristics of the Rhodospermeæ, or red series.

GASTROCARPEÆ TRIBE.

"PLANTS marine, of a pink, purple, or dull red colour; of a fleshy, gelatinoso-cartilaginous, or membranaceous substance. Frond either cylindrical, compressed or flat, destitute of midrib or veins. Fructification: globules or clusters of minute red seeds, imbedded in the substance of the frond."

HARVEY.

THIS tribe comprises four genera. Catenella, the only undescribed genus, contains but one small species, C. opuntia, with small jointed fronds,

growing matted together, and not above an inch in height. Not uncommon on rocks, near high water mark. In the next genus, Dumontia, also occurs but one species, D. filiformis, an exceedingly variable plant, with long and often twisted fronds, of a dull purple colour. Grows on rocks and in deep pools left by the tide. The genus Halymenia numbered, until very lately, but two British species ; H. ligulata and furcellata. The third was discovered by my friend Miss Warren, in Falmouth Harbour, some years since. This plant Dr. Harvey has lately determined to be identical with the Halymenia Dubyi of Cheverin, a native of the coast of Normandy. The substance in Iridæa is much tougher and firmer than in Halymenia. I. edulis (the only species in this genus) is sometimes eaten by the poor, either raw or fried.

GENERA OF THE GASTROCARPEÆ TRIBE.

Dumontia. "Frond cylindrical, tubular, dull red, or greenish."

Halymenia. Frond either flat or cylindrical, of a soft membranaceous structure, and pinky red colour.

Iridæa. Frond undivided, thick and flat, of a deep red colour.

DUMONTIA.

Named after M. Dumont, a French naturalist.

"*Frond* cylindrical, simple or branched, membranaceous, tubular, gelatinous within, of a red or purplish colour. *Fructification:* globules of seeds attached to the inner surface of the membrane of the frond."

HARVEY.

DUMONTIA FILIFORMIS.—THREADLIKE DUMONTIA.

Frond hollow, long. In var. β. crispata, the fronds are flattened, curiously curled and twisted, arising from the base: in other varieties the branches proceed from a main stem, and are not above two or three inches high. Grows on rocks and stones in the sea; common. Near Christchurch, Hants; Torquay. β crispata, very common at Falmouth, Youghal, Belfast Bay, Frith of Forth.

HALYMENIA.

Name meaning *Sea-membrane.*

"*Frond* nearly flat or cylindrical, gelatinoso-membranaceous, of a pinky-red colour, more or less dichotomous, the segments often laciniated. *Fructification:* punctiform globules of seeds, imbedded in the central substance of the frond."

Greville, in Harvey.

HALYMENIA LIGULATA.—STRAP-LEAVED HALYMENIA.

A SOFT, membranaceous, pinky-red coloured plant; very variable in the shape and branchings of its fronds. Dr. Harvey thus describes the three principal varieties :—" 1. dichotoma; (Forked var.) frond 6-8 inches long, half a line to one or two lines broad, compressed, very gelatinous, many times divided in an irregularly dichotomous (forked) manner. 2. ramentacea (Branched var.) ; frond 12-14 inches long, compressed, divided into three or four principal lobes or branches, from half an inch to an inch in breadth, and from 1-4 inches long. 3. latifolia (Broad-leaved var.); frond 12-20 inches long, 2-4 inches wide in the widest part, rising from a minute stem, wedge-form, either simple or forked ; of a dark red colour, and soft, but not very gelatinous substance. The fructification is abundantly scattered over every part of the frond, and to the naked eye, resembles minute dark red dots." P. 52.

On rocks and stones, in the sea, Torquay. Chiefly along the southern shores of England and Ireland.

O. S. H. furcellata, rare. Sherringham, Norfolk ; Southampton, Mount's Bay ; eastern and southern shores of England ; Bantry Bay ; Miltoun Malbay ; Glenarm.

H. Dubyi. Frond with a short stem, not branched, and of a dull pink colour. Found by Miss Warren on the Flushing side of Falmouth Harbour.

IRIDÆA.

Named from the *iridescent* hues of some of the species when recent.

Frond flat, expanded, fleshy or gelatinous, and rather cartilaginous, of a deep red colour. *Fructification* : seeds imbedded between the two coats of the frond.

1. IRIDÆA EDULIS. *pl. 2.* 3. RHODOMENIA LACINIATA. *pl. 73.*
2. NITOPHYLLUM ULVOIDEUM *pl. 72.* 4. RHODONTHALIA DENTATA. *pl. 71.*

W. DICKES DEL.

IRIDÆA EDULIS.—EDIBLE IRIDÆA.

Fronds numerous, arising from one root, ovate, and somewhat wedge-shaped; the substance tough and leathery. "*Fructification* near the extremity in wide patches, frequently spreading over a large portion of the frond." On rocks and stones in the sea, common. Dover, Torquay, shores of North Wales, Leith. This is eaten raw, and also after being pinched with hot irons, and is then said to taste like roasted oysters.

FLORIDEÆ TRIBE.

Plants marine, of a purplish-red or fine rose colour, of a leathery, a cartilaginous, or a membranaceous substance, and cellular texture; the cellules often highly developed. Frond either flat, leafy, compressed or cylindrical, occasionally filiform or filamentous, inarticulate. Fructification mostly double, and produced on distinct individuals of the same species: 1. Capsules, or tubercles containing

a mass of ovate, or pear-shaped seeds; 2. Granules, either scattered or collected into little groups, and situated either in the substance of the frond, or in distinct processes."

HARVEY.

This is a striking and beautiful tribe; containing the Delesseria, with perfect leaf-like fronds of a rose-red colour. The paler and more delicate Nitophilla—

> "How their blushes speak
> Of rosy hues that bright o'er ocean break,
> When cloudy morn is calm; yet fain to weep,
> Because the beautiful are still the frail."

Fortunately for the botanist, though they soon lose their colour when exposed to the sun and air, when once dried they preserve their rich tints unaltered for a length of time. The Rhodomeniæ are of a thicker substance, and deeper colour, than the Nitophilla. Plocamium and Ptilota: both delicate, branched, feathery species, frequent on most shores; the former of a light pinky red, the latter very dark crimson, nearly black when dried. Besides

those genera described below, there are five others belonging to this tribe. Microcladia, a genus occurring between Plocamium and Odonthalia, contains one species, M. glandulosa; not unlike a poor specimen of P. coccineum, but without comb-like ramuli. This plant is said to be very rare; it has been found at Budleigh Salterton, and Torquay, South Devon. I have met with it at Falmouth, Cornwall; and have reason to think it is not very uncommon on that coast. The number of species in Rhodomela is four. They are very dark in colour, turning nearly black when dry; with cylindrical or threadlike branches; R. subfusca is common on the stems of the larger Algæ. The next genus contains one species, Bonnemaisonia asparagoides, of a fine red colonr, with slender hairlike branches; found at a few places in England and Ireland. Grateloupia comprises one species, G. filicina; a rare plant, only found at Sidmouth, Torquay, Ilfracombe, and the Land's End. Plentiful at St. Michael's Mount; and Long Rock, more sparingly.

GENERA OF THE FLORIDEÆ TRIBE.

Delesseria. Frond leaflike, with a midrib running through it.

Nitophyllum. Frond without a midrib, delicate, expanded. "Granules forming distinct sori" (spots).

Rhodomenia. Frond spread out, without a midrib; substance, membranaceous. "Granules forming indistinct diffused cloudy spots."

Plocamium. Frond threadlike, much branched, delicate, of a pinky red; the ramuli (small branches) with comblike divisions.

Odonthalia. Frond flat, serrated, with a faint midrib. Colour, very dark red.

Laurencia. Frond flattened or round, of a rather gelatinous or cartilaginous structure. Yellowish or reddish colour.

Chylocladia. Frond gelatinous, mostly with joint-like contractions; of a pinky red colour.

Gigartina. Frond cartilaginous, cylindrical; of a dull red colour.

Chondrus. Frond cartilaginous, narrow at base, then spreading out into variously forked, cleft divisions. Dark purple or red.

Phyllophora. Frond membranaceous, with smaller fronds arising from the surface of the frond. Colour, fine full red.

Sphærococcus. Frond branched in an opposite manner, of a cartilaginous texture. Colour, in the stem, deep red; paler in the branches.

Gelidium. "Frond horny or cartilaginous," with pinnated or twice pinnated branches. Colour, deep red.

Ptilota. Frond pinnate, feathery. Colour, very dark red.

Note. Another genus has been added by the discovery of Stenogramme interrupta found by Dr. John Cocks, near Plymouth, in October, 1847. This interesting addition to our Marine Flora is figured and described by Dr. Harvey, in the number for March, 1848, of his valuable and beautiful work, the "Phycologia Britannica."

DELESSERIA.

Named in honour of *M. Benj. Delessert*, a distinguished French naturalist, and patron of Botany.

"*Frond* rose-red, flat, membranaceous, with a percurrent midrib. *Fructification* of two kinds, or distinct individuals. 1, *capsules*, a globular mass of seeds; 2, ternate *granules*, forming definite spots in the frond, or in distinct leaflike processes."

GREVILLE, IN HARVEY.

DELESSERIA SANGUINEA.—RED DOCK-LEAVED DELESSERIA.

STEM cartilaginous, bearing beautiful, large, rich, rose-red fronds, in shape and colour like the leaves of the Red Dock (Rumex sanguineus). In the summer the fronds are large, with a waved margin; smaller leaves often springing from the midrib of the old frond. The winter state presents a remarkable contrast, the membranaceous part of the fronds decays, and there remains alone the naked stem, which then bears its fructification, either in *cap-*

sules on little stalks, or *granules* produced in little leaflike bodies. Substance, delicate; adhering firmly to paper. This beautiful plant grows on the stems of the larger Algæ, and on rocks in the sea. Common on rocks near Scarborough, Yarmouth, Dover. Weymouth, small and imperfect. Torquay, not nearly so large and perfect as those specimens from the south coast of Cornwall. Falmouth Bay. I have a plant from this bay, the fronds of which are nearly ten inches in length. Mount's Bay. The Scilly Isles affcrd specimens of a gigantic size. North coasts of Ireland. Leith, Scotland.

DELESSERIA SINUOSA.—OAK-LEAVED DELESSERIA.

Fronds irregular in their outline, jagged, with a clear well-defined midrib. Colour, claret red; not so bright as in the preceding, nor does it adhere to paper so firmly. Fructification: *capsules* in the leaves; *granules*, fringing the margin of the stem, contained in small processes. Grows on the larger Algæ. Common.

DELESSERIA ALATA.—WINGED DELESSERIA.

Stem forked, and much branched. Fronds not in a leaf-like form, but continuing along each side of the branches. "*Capsules* attached to the midrib, *granules* imbedded in little leafy processes of the midrib." Common on the larger Algæ.

DELESSERIA HYPOGLOSSUM.—TONGUE-BEARING DELESSERIA.

Fronds narrow, lance-shaped, with a midrib, from which arises a second series of fronds resembling the first in outline. Colour, pinky red, soon given out in fresh water. Substance, thin and delicate, adhering well to paper. Grows on rocks and the larger Algæ. Not very common. Rocks near Scarborough, rare. Near Sunderland, Cromer, Yarmouth, Falmouth, frequent. "Specimens gathered at Bantry Bay, in Ireland, are of very large size; the primary leaf being 6-8 inches long, and half an inch wide." The leaves are in general not

above a quarter of an inch in breadth, and in some varieties narrower still. Rare in Scotland.

DELESSERIA RUSCIFOLIA.—BOX-LEAVED DELESSERIA.

Not unlike the last species, but the fronds are smaller, rounder, and wider. Colour deeper, and the substance is rather firmer. Grows on other Algæ, and rocks in the sea. Not common. Yarmouth; Falmouth, Cornwall; and other places on the south coast of England.

NITOPHYLLUM.

Name signifying a *shining leaf.*

"*Frond* plane, reticulated, delicately membranaceous, rose-coloured, wholly without veins, or with very slight vague ones towards the base. *Fructification:* capsules imbedded in the substance of the frond, and granules, forming distinct, scattered spots."

Greville.

"The absence of a nerve distinguishes this genus from *Delesseria;* as do the thinner more reticulated substance, and *distinct* spots of granules, from *Rhodomenia.*"

Harvey.

NITOPHYLLUM GMELINI.—GMELIN'S NITOPHYLLUM.

"Frond with a short stalk, more or less fan-shaped, with a roundish outline, variously cleft into broadly wedge-shaped segments, waved, curled, and rather crisp, marked near the base (and sometimes over the surface) with vague vanishing nerves; spots of granules linear, confined to the margin."

Harvey.

Colour, a purplish red. Substance, rather rigid when first gathered, but soon decomposing on exposure to the air. Grows on rocks in the sea. Ilfracombe, and other places on the Devon coast; Whitsand Bay; Falmouth, and Mount's Bay; Bantry Bay. Several stations on the north-east coast of Ireland; Kilkee, west of Ireland.

NITOPHYLLUM LACERATUM.—TORN NITOPHYLLUM.

"Frond sessile, much divided in a dichotomous (forked) manner, marked with flexuous veins; segments mostly linear, variously cleft, waved at the margin; spots of granules oblong, either marginal, or borne on distinct, leafy processes of the margin." The fronds of this plant vary from two to ten inches in length; the var. β. uncinatum "is a much smaller state, having the ends of the branches hooked into the form of a sickle." Common on Algæ and corallines.

O. S.H. punctatum. Dotted Nitophyllum. Grows attached to various Algæ. Substance of the frond thin, the segments forked. Spots of granules large, either scattered over the surface, or in the centre of the frond. Torquay; Sidmouth; coast of Cornwall; Swansea, South Wales; Bantry Bay; Larne, near Belfast. "Frond commonly from four to twelve inches long, and about as broad, but in favourable situations much larger, and in some gigantic specimens gathered by Mr. D. Moore, at Cushendall

Bay, north of Ireland, five feet long and three feet wide."

HARVEY.

N. ulvoideum. In the sea; rare. Torquay; Plymouth; Mount's Bay; Penzance; Scilly Isles; Bantry Bay, Ireland; coast of Moray, Scotland.

N. Bonnemaisonia. On rocks and stones in the sea; rare. Torquay, Ilfracombe, Larne, Youghal, Tramore, Miltoun Malbay; Orkney, Bute, in Scotland.

N. versicolor. A doubtful species, found by Mrs. Griffiths at Ilfracombe.

RHODOMENIA.

Name signifying *Red-membrane.*

"*Frond* plane, membranaceous, fine pink or red, quite veinless, sessile, or with a short stem, which expands immediately into the frond. *Fructification:* 1. scattered *capsules*; 2. minute *granules*, spreading over the whole, or some part of the frond (not in distinct spots or sori.)"

GREVILLE, IN HARVEY.

RHODOMENIA LACINIATA.—JAGGED RHODOMENIA.

Frond thick, cleft in a palmate manner, the segments slightly forked. Substance, firm, opaque, much thicker than in Nitophyllum. Colour, bright red. This plant is often fringed along the margin of the fronds, with little leaflike processes: in these are contained the *capsules;* the *granules* form cloudy spots along the margin of the frond. Common on rocks and stones in the sea.

RHODOMENIA PALMATA.—HAND-SHAPED RHODOMENIA.

The "Dulse" of Northumberland and Scotland, "Dillish" of the Irish. This plant is much eaten by the poor along the shores of Ireland and Scotland, and other northern countries. "After being soaked in fresh water, it is eaten either boiled or fried, and in the latter state has something of a violet flavour." The smaller variety, which grows on rocks and shells, is called "Shell-dellish;" and is much

sweeter than that growing on the stems of the Laminariæ. Fronds divided in a palmate manner; that is, like a hand with the fingers spread out, often narrow and forked; in others cleft into variously divided branches. The var. β. Sarniensis, or Guernsey var., has the branches forked and very narrow; when of a green colour, as is often the case, this var. nearly resembles in its outline, a plant of the Dictyota dichotoma. Found at the Channel Islands; in Dublin Bay, and on the Scotch coast.

Fructification: *granules,* in cloudlike spots, spread over the whole surface of the frond. Substance, tender when young, but afterwards thick and leathery. Very common on rocks, and stems of the Laminariæ.

O. S. R. bifida. Grows on rocks, and Algæ. Near Whitburn and Tynemouth; Yarmouth; coast of Hampshire; Torbay. Frequent on the southern shores of England; Bantry Bay, and Belfast Bay, Ireland.

R. polycarpa. Very rare. Salcombe Bay; shore under Tait's Hill, Plymouth; Whitsand Bay.

R. Palmetta. On rocks or stems of Laminaria digitata. Not uncommon. Torquay.

R. cristata. On the stems of Laminaria digitata. Very rare. Sea-shore at Wick, Caithness; Frith of Forth, Berwick.

R. ciliata. On rocks and stones in the sea.

R. jubata. Frequent along the southern shores of England; Bantry, coast of Clare.

R. sobolifera. On the stems of Laminaria digitata. Shores of the Orkney Isles; Mull of Galloway; Glenarm, Ireland; Strangford Lough, common.

R. reniformis. Rather rare. Niton, Isle of Wight; Budleigh Salterton; Torbay and Ilfracombe, very fine; Whitsand Bay, Cornwall; Bantry Bay; Malbay and Kilkee; Mouth of the Bann; north of Ireland; Glenarm; Bangor, co. Down; Orkney.

PROCLAMIUM.

Name meaning *intertwined hair*, in allusion to the finely-branched fronds.]

"*Frond* filiform, compressed, between membra-

naceous and cartilaginous, fine pink red, much branched, branches distichous, (alternately secund and pectinate.) Fructification: sessile *capsules*, and lateral minute *processes* containing granules."

GREVILLE, IN HARVEY.

PLOCAMIUM COCCINEUM.—SCARLET PLOCAMIUM.

A BEAUTIFUL and very common sea-plant; the fronds much branched and feathery; small ramuli or branches, with comblike divisions. *Capsules* sessile on the edge of the upper branches, each one about the size and colour of a poppy seed. The *granules* are in receptacles, borne by the smaller branches. Colour, a fine pinky red. Substance, not at all flaccid; and though so delicate in its branchings, it is a very easy species to spread out, only requiring to be laid in a plate with sufficient water to float the branches, which, with the help of a camel-hair pencil, will soon fall in their natural, and therefore most elegant position.

PLOCAMIUN COCCINEUM

W.DICKES DEL.

ODONTHALIA.

Name, a *tooth*, and the *sea*, meaning a toothed sea-plant.

"*Frond* plane, between membranaceous and cartilaginous, dark vinous red, with an imperfect or obsolete midrib, and alternately toothed margin."

GREVILLE.

Fructification: 1, *capsules*, containing pear-shaped seeds; 2, slender processes, containing ternate granules.

ODONTHALIA DENTATA.—TOOTHED ODONTHALIA.

FRONDS, from three to twelve inches long, much branched, with a slight and imperfect midrib at the base; branches narrow, toothed, or pinnatifid. Fructification borne on little slender stalks along the margin of the frond. Substance, between cartilaginous and membranaceous. Colour, deep red, becoming darker in drying. Grows on rocks and stones in the sea. Frequent on the shores of Scotland, and of the north of England and Ireland.

LAURENCIA.

Named after *M. de la Laurencie*, a French naturalist.

"*Frond* cylindrical or compressed, between cartilaginous and gelatinous; mostly yellowish or purpleish red."

GREVILLE.

Fructification: 1, ovate capsules, containing a cluster of stalked, pear-shaped seeds; 2, granules imbedded in the ramuli.

LAURENCIA PINNATIFIDA.—PINNATIFID LAURENCIA.

THIS is a very variable plant, with pinnatifid or twice pinnatifid branches. In the var. β Osmunda, the frond is flat, undivided, with short ramuli. V. augusta: ramuli, nearly cylindrical, much divided, and bushy;—δ, tenuissima, frond flat; ramuli, very thin, and much branched. The smell of this plant, and all its varieties, is peculiarly offensive. Colour, varying from a yellowish green to a dull purple; soon, on exposure to the air, becoming flaccid, and

1. LAURENCIA PINNATIFIDA . . p. 79
2. CHYLOCLADIA ARTICULATA . 82
3. GIGARTINA PURPURASCENS . p. 83
4. CHONDRUS CRISPUS 85

W. Dickes 7th.

of a pale lilac colour. It has been called the "Pepper-dulse," owing to its biting and aromatic flavour.

LAURENCIA OBTUSA.—BLUNTED LAURENCIA.

"From three to five inches high; the stem as thick as pack thread, of the colour of isinglas; but the outer coat of the branches, and their segments, have a beautiful pink colour." The ramuli are mostly opposite, short, wedge-shaped, and blunt. Colour, a fine but fleeting pink. Substance, tender and flaccid, soon decomposing. This plant is said to smell like violets. Grows on the larger Algæ. Hastings, Sussex; Devonshire coast. Frequent along the southern shores of England. Sunderland; Flamborough Head; Frith of Forth, very rare. Bantry Bay; Bangor; Belfast Bay; Ireland's Eye, Ayrshire.

O. S. L. dasyphylla. Frequent on the eastern and southern shores of England. Bute; Lossie-

mouth, Scotland; Belfast Bay; Bantry Bay; west coast of Ireland.

L. tenuissima. Very rare. Isle of Wight, Isle of Jersey, Weymouth, Torquay, Cornwall, Ballycotton, coast of Cork.

CHYLOCLADIA.

Name, *juicy branch*, alluding to the succulent frond.

"*Frond* cylindrical, filiform, (often contracted, as if jointed;) between gelatinous and cartilaginous; of a pinky red colour."

GREVILLE.

Fructification: 1, capsules, containing seeds; 2, imbedded ternate granules.

CHYLOCLADIA CLAVELLOSA.—STONECROP CHYLOCLADIA.

FRONDS not contracted; branches either opposite or alternate, spreading and bearing small narrow ramuli. Substance, soft and slippery; adheres closely to paper. Colour, pale pink. Grows on the larger Algæ. "Found at various places on the

coasts of England, Scotland, and Ireland; but nowhere very common." Falmouth and Penzance, not unfrequent.

CHYLOCLADIA OVALIS.—EGG-SHAPED CHYLOCLADIA.

Fronds branched, bearing roundish, oval, or lance-shaped ramuli, filled with a jellylike fluid. Substance of the stem, firm and rigid; of the ramuli, soft, adhering to paper. Grows on rocks and other Algæ. Frequent on the shores of England and Ireland.

CHYLOCLADIA KALIFORMIS.—JOINTED SALTWORT CHYLOCLADIA.

Frond contracted, as if jointed. Stem bearing long simple branches, either opposite or in whorls; ramuli much and closely contracted, which gives them a beadlike appearance. Substance tender, adhering to paper. Colour, dull purplish-red, staining the paper on which it is dried of a bright red.

Grows on rocks and the other Algæ. Frequent on the shores of England, Scotland, and Ireland.

CHYLOCLADIA PARVULA.—LESSER-JOINTED SALTWORT CHYLOCLADIA.

Fronds contracted in the same way as the preceding, but the joints are much shorter, and the whole plant is much smaller. Substance soft. Colour, a pinky-red. Grows on the larger Algæ; Brighton; Devonshire; Falmouth, and Penzance, Cornwall; Bantry; Kilkee; Malbay, and Wicklow, co. Antrim; Portrush, Ireland.

CHYLOCLADIA ARTICULATA.—JOINTED CORALLINE-LIKE CHYLOCLADIA.

The contractions strongly marked throughout; branches springing in a forked and tufted manner; ramuli either opposite or whorled. Substance membranaceous. Colour, pale red purple, transparent. Grows on rocks and the larger Algæ. Frequent.

GIGARTINA.

Name, a *grape-stone*, which the capsules resemble.

"*Frond* cartilaginous, filiform, cylindrical, or compressed; of a dull red colour."

GREVILLE.

Fructification: 1, capsules, containing a mass of minute seeds; 2, granules imbedded in the frond of distinct plants.

GIGARTINA PURPURASCENS.—PURPLE GIGARTINA.

FROND cylindrical, hair-like. Stem naked at base for a short space; then bearing alternate spreading branches, which are often again branched, and give the plant a bushy appearance. Substance firm, scarcely adhering to paper. Colour, purplish; nearly black when dry. Grows on rocks and stones in the sea. Very frequent.

GIGARTINA? PLICATA.—MATTED GIGARTINA?

FROND wiry, branched, very rigid, and much

tangled ; ramuli often forked. Colour, dark purple ; black when dry ; whitish in decay. Substance stiff, and brittle when dry. On rocky sea-shores.

O. S. G. confervoides. Sea-shores, not unfrequent.

G. erecta. Very rare. Sidmouth ; Torquay ; Belfast Bay ; Port Ballantrae ; North of Ireland.

G. compressa. Very rare. Sidmouth.

G. pistillata. Very rare. Coast of Cornwall ; Mount's Bay ; Padstow ; Whitsand Bay.

G. acicularis. Rare. Torquay ; coast of Cornwall ; Belfast.

G. Teedii. Very rare. Torbay.

G ? Griffithsiæ. Coast of Devon ; Long Rock ; Mount's Bay, Cornwall ; Bantry Bay ; Balbriggan.

CHONDRUS.

Name, signifying *cartilage*, alluding to the substance of the frond.

"*Frond* cartilaginous, dilating upwards into a flat, nerveless, dichotomously divided frond ; of a purplish or livid red colour.

Fructification: sub-sphærical capsules in the substance of the frond, (rarely supported on little stalks,) and containing a mass of minute free seeds.

GREVILLE, IN HARVEY.

CHONDRUS MAMILLOSUS.—WARTY CHONDRUS.

FROND cartilaginous, forked, segments wedge-shaped. Capsules borne on small processes, in great numbers, on the surface of the upper segments, giving them the appearance of being covered with small warts. Colour, dark purple. Substance tough. Grows on rocks in the sea. Frequent.

CHONDRUS CRISPUS.—CRISPED CHONDRUS.

FRONDS forked, curled or flat; segments varying in breadth. Mrs. Griffiths remarks, in Turner's History of this species, that "every pool upon the Devonshire coast produces a dissimilar sort; and where there is any mixture of fresh water, the

varieties are monstrous, as well as endless." Colour, purplish-green, or yellowish-green. Substance horny. Frequent on rocky shores. This, and the preceding species, are sold in the shops under the name of Carrigeen, or Irish Moss, which, when well boiled, forms a pleasant and nutritious jelly.

CHONDRUS MEMBRANIFOLIUS.—MEMBRANOUS-LEAVED CHONDRUS.

"Stem cylindrical, irregularly branched, the branches expanding into wedge-shaped or fan-shaped, dichotomously-cleft membranaceous *frondlets*, about an inch in length, and more or less divided. The substance of the stem is cartilaginous, of the frondlets membranaceous." Colour, brownish red.

O. S. C. Norvegicus. Rare. Dover; coast of Sussex; Exmouth; Mount's Bay; Swansea; Bantry; Youghal; Miltoun Malbay, Ireland.

C. Brodiæi. Rare. Eastern coasts of Scotland, frequent; Mouth of the Bann, co. Derry; Belfast Bay; Devonshire.

PHYLLOPHORA.

Name, *leaf-bearing*, so called from proliferous frond.

"*Frond* cartilaginous or membranaceous, of a purple or rose-red colour, plane, proliferous from the disk, furnished with a more or less imperfect or obscure midrib."

GREVILLE.

PHYLLOPHORA RUBENS.—RED PHYLLOPHORA.

STEM short, expanding into a narrow wedge-shaped frond, which produces from the surface another frond similar to the first, which again bears a new frond in like manner. *Capsules* small, scattered over the frond. Colour, fine red. Substance membranaceous, not adhering well to paper. Grows on rocks in the sea. Not uncommon.

SPHÆROCOCCUS.

Name, signifying *sphere-shaped seeds.*

"*Frond* cartilaginous, compressed, two-edged, linear, distichously branched."

GREVILLE.

Fructification: pointed capsules, containing the seeds.

SPHÆROCOCCUS CORONOPIFOLIUS.—FRINGED SPHÆROCOCCUS.

Fronds much branched, spreading, feathery. The upper branches fringed with small processes, in which the capsules are often contained. Colour, scarlet; darker in the main stem. Substance rather stiff, horny when dried, not adhering to paper. Southern shores of England, not uncommon. Isle of Wight and Isle of Jersey, frequent; Dorset; Devon; Cornwall; western and southern shores of Ireland, not uncommon. Bantry Bay; Belfast. Very rare in Scotland; Bute.

GELIDEUM.

Name in allusion to the gelatinous nature of some of the species when macerated.

"*Frond* between cartilaginous and horny, compressed, linear, more or less regularly pinnated."

Greville

1. GELIDIUM CORNEUM. p. 89.
2. PTILOTA PLUMOSA. 90.
3. POLYSIPHONIA FASTIGIATA. p. 93.
4. GRIFFITHSIA CORALLINA. 102.

W. DICKES. LITH.

Fructification: 1, capsules imbedded in the substance of the ramuli; 2, granules in the ramuli on distinct individuals.

GELIDEUM CORNEUM.—HORNY GELIDEUM.

Frond much divided, pinnate; the branches and pinnæ mostly opposite. Colour, red. Substance cartilaginous, firm, does not adhere to paper. An extremely variable plant; twelve varieties of which are given by Dr. Greville in his Algæ Britannicæ. Frequent on rocky shores.

O. S. G. cartilagineum. Only once found by Dr. Withering, at Freshwater Bay, Isle of Wight.

G? rostratum. In the sea; Scarborough; Lossiemouth, Morayshire.

PTILOTA.

Name meaning *pinnated*, in allusion to the finely-winged frond.

"*Frond* compressed or flat, pectinato-pinnate, of a red colour, between membranaceous and cartila-

ginous. *Fructification:* minute aggregated capsules, surrounded by an involucre."

GREVILLE.

PTILOTA PLUMOSA.—FEATHERY PTILOTA.

FRONDS much branched, set with slender, spreading, opposite or alternate ramuli; fine, delicate, and featherlike. Colour, dark red, substance cartilaginous. In the var. β. capillaris, the substance is more flaccid, mostly covered with parasites, smaller, and of a duller colour, with the extreme ramuli jointed. On rocky shores, common.

CERAMIEÆ.—CERAMIUM TRIBE.

"PLANTS marine (with the exception of Trentepohlia,) of a red, purple or reddish-brown, rarely brown, colour, staining fresh water with more or less of a red hue, of a cartilaginous or flaccid substance and cellular texture. Frond filamentous, cylindrical or compressed, jointed. Fructification double; 1. capsules containing a mass of seeds;

2. granules contained in distorted ramuli, or in proper receptacles."

HARVEY.

MANY of the species in this tribe are exceedingly beautiful objects for the microscope, but very difficult plants to recognise with the naked eye, especially the Polysiphonia and Callithamnia; the former have slender, hairlike branches, the latter are delicate, soft, feathery species, mostly parasitical on the larger Algæ. The other genera, Dasya, Ceramium, and Griffithsia, are easily known by their distinctive characters. The undescribed genera contain but one species in each; Spyridia filamentosa, and Trentepohlia pulchella; which latter is an inhabitant of mountain streams. The following poetic description by Bishop Mant, though applied by him to a different class of plants, equally well pourtrays this delicate and no less beautiful tribe of Algæ :—

"Soft as the cygnet's downy plume,
Or produce of the silkworm's loom;
Survey them by the unaided eye,
And if the seeds within you lie
Of love for *natural beauty* true,
They'll shoot enliven'd at the view

Of hair or feather-mantled stem,
The waving stalk, the fringed gem,
Enveloping its chaliced fruit,
So fair, so perfect, so minute,
That bursting forth, the seeds may seem
A floating cloud of vapoury steam.
These by the microscopic glass
Survey'd, you'll see how far surpass
The works of nature, in design
And texture delicately fine,
And perfectness of every part,
Each effort of mimetic art."

GENERA OF THE CERAMIUM TRIBE.

Polysiphonia. "Frond longitudinally striate, with internal, parallel tubes. Granules in distorted ramuli."

HARVEY.

Dasya. Stem inarticulate, with articulate, spreading, pinnate ramuli. Colour, a rich rose-red.

Ceramium. The branches articulate, without pinnate ramuli.

Griffithsia. The filaments or branches with evident articulations often forked.

Callithamnion. Filaments mostly pinnated, rarely forked.

POLYSIPHONIA.

Name meaning *many-tubed*, in allusion to the structure of the frond.

"*Frond* filamentous, partially or generally articulate; joints longitudinally striate, composed internally of parallel tubes. *Fructification:* double, on distinct plants: 1. ovate *capsules;* 2. *granules*, imbedded in swollen branchlets."

HARVEY.

POLYSIPHONIA FASTIGIATA—TUFTED POLYSPHONIA.

FILAMENTS rigid, bristly, nearly of the same length, forming round tufts, repeatedly forked. Grows on the stems of Fucus nodosus and vesiculosus; very common on the former. Colour brownish, black when dry. Substance rather rigid.

POLYSIPHONIA BRODIÆI.—BRODIE'S POLYSIPHONIA.

"STEMS inarticulate, robust, cartilaginous, alternately branched; branches pinnated, with spreading,

pencilled, multifid, delicate, flaccid ramuli. Colour, a dark brownish-purple. Substance gelatinous, instantly decomposing, and giving out a disagreeable smell if immersed in fresh water."

HARVEY.

POLYSIPHONIA FIBRATA.—FIBROUS-BRANCHED POLYSIPHONIA.

STEM short, robust, with many flaccid branches of a darkish or reddish-brown colour, very soon decomposing in fresh water. Grows on rocks, stones, and Algæ, not uncommon.

POLYSIPHONIA FORMOSA.—BEAUTIFUL POLYSIPHONIA.

FILAMENTS much branched, very slender, flaccid, from six to ten inches high. Colour, reddish-brown. This plant has, from the wavy outlines of its branchings, a peculiarly graceful appearance when spread on paper. On rocks and Algæ. Not uncommon.

P. LYSIPHONIA FORMOSA.

W. Dickes del.

POLYSIPHONIA URCEOLATA.—HAIR-LIKE POLYSIPHONIA.

The capsules are pitcher-shaped, whence the specific name *Urceolata.*

"Stems 3-9 inches high, dark red, as thick as horse-hair at the base, loosely entangled in large bundles, scarcely attenuated, rigid, not collapsing on removal from water, and very imperfectly adhering to paper." Grows on rocks and the larger Algæ. β. patens, less branched, generally grows on the stems of Laminaria digitata.

POLYSIPHONIA ELONGATA—"LOBSTER-HORN" POLYSIPHONIA.

"Stems robust, cartilaginous, irregularly branched ; beset, especially towards the t ips, with slender, tufted, multifid ramuli." Colour brownish-red, the ramuli crimson. Substance in the stem rigid, but flaccid in the ramuli, which closely adhere to paper. Grows on rocks, stones, and corallines.

O. S. P. parasitica. Not common. Scarborough not unfrequent. Coasts of Yorkshire, Dorset, Devon,

and Bantry. West of Ireland, near Wicklow. Frith of Forth, Mount's Bay, and Land's End.

P. cristata. Very rare. Bantry Bay; Whitsand Bay, Cornwall.

P. thuyoides. Frequent. Devonshire, St. Michael's Mount, Bantry Bay. Common in Malbay, west of Ireland. Portrush Bay, Ayrshire coast.

P. fructiculosa. Southern shores of England, frequent. Bantry Bay; Portrush; coast of Down, Ireland; Appin, Scotland.

P. subulifera. Very rare. Torquay. Var. β. Templetoni, in Belfast Bay.

P. spinulosa. Extremely rare. Torquay; Appin, Scotland.

P. atro-rubescens. Not uncommon on rocks in the sea.

P. purpurascens. Appin, Scotland.

P. nigrescens. "Filaments robust, rigid." Colour, dull brown; black when dry. Common on rocks and Algæ.

P. atro-purpurea. Belfast; Lough Larne, coast of Down.

P. affinis. Carnlough, near Glenarm; Cushendall, Ireland.

P. furcellata. Sidmouth and Torbay.

P. Richardsoni. Colvend, Dumfries.

P. Griffithsiana. At Torquay.

P. Carmichaeliana. Appin.

P. fibrillosa. Straw-coloured. Brighton and Shoreham, Seaton, Sidmouth, Torquay, Bantry Bay.

P. violacea. Elberry Cove and Torquay, Salcombe, Falmouth Harbour, Belfast Lough.

P. Grevillii. Shores of Bute.

P. stricta. "In the sea, on sand-covered rocks. Not uncommon."

P. pulvinata. Ilfracombe and Torbay. Plentiful at the Land's End, Miltoun Malbay, Port Stewart.

P. elongella. On rocks in the sea. Sidmouth, Torbay, Dublin Bay, Belfast Bay, Larne.

P. byssoides. Abundant on the eastern and southern shores of England and Ireland; rare in Scotland, and the west of Ireland. Bantry, Malbay, Frith of Forth, Ayrshire. The branches of this plant bear "spreading byssoid fibres, or ramuli,

which give the frond a beautifully feathery appearance."

HARVEY.

DASYA.

Name *hairy*, in allusion to the slender hairlike ramuli.

"*Frond* filamentous; main stems inarticulate, cartilaginous, beset with jointed, pencilled, or pinnate ramuli."

HARVEY.

Fructification, double: roundish, taper-pointed; capsules two, lanceolate; *receptacles* containing granules.

DASYA COCCINEA.—SCARLET DASYA.

A BEAUTIFUL feathery-looking plant, "not unlike a fir-tree in its general shape." The branches twice-pinnate. Stem, rather firm. Colour, dark red, becoming bright scarlet. Substance, variable, in some specimens adhering firmly to paper, in others cartilaginous. In the sea, common. Rather rare in Scotland.

1. CERAMIUM RUBRUM. p. 93
2. CALLITHAMNION TETRAGONUM. 104
3. CONFERVA RUPESTRIS. p. 110.
4. ENTEROMORPHA INTESTINALIS. 116.

O. S. D. ocellata. Rare. Abundant on the Pier at Torquay; St. Michael's Mount, Mousehole, and Whitsand Bay, Cornwall; Wicklow.

D. Arbuscula. Not uncommon on the shores of Ireland and Scotland. Very fine at Bantry; Budleigh Salterton, Devon; Falmouth, Cornwall; and the Land's End.

CERANIUM.

Name, a *little pitcher*, which the capsules of some of the species resemble.

"*Filaments* articulated, mostly dichotomous, reticulated with veins; dissepiments opaque."

HARVEY.

Fructification, double: 1, *capsules:* 2, *granules*, partly imbedded in the joints of the branchlets.

CERANIUM RUBRUM.—RED CERANIUM.

A VERY common plant on rocks and Algæ. The branches exceedingly variable in their manner of branching, slightly forked, more or less distinctly jointed. "Colour, varying from a full to a pale red,

or near high-water mark to yellowish. A most variable plant, whose endless forms the young botanist is sure to gather as so many species."

HARVEY.

CERANIUM DIAPHANUM.—RED-DOTTED CERANIUM.

VERY much and irregularly branched. The whole frond is distinctly jointed; the partitions, dark red; and the joints are semi-transparent, giving the plant a beautifully variegated appearance. On rocks in the sea, common.

CERANIUM CILIATUM.—CILIATED CERANIUM.

STEMS tufted; the tips of the branches hooked inwards. This species very much resembles the former, but is known by its rigid and harsh substance. On rocks and corallines.

O. S. C. fastigiatum. Filaments, slender. On rocks, &c.; Torquay.

C. Agardhianum. Filaments, rather rigid. Colour, dark purple, the joints transparent. Pier at Torquay; Belfast Bay.

GRIFFITHSIA.

"Named in honour of Mrs. Griffiths, of Torquay, Devonshire, to whose numerous discoveries and accurate observations the marine botany of Great Britain is indebted for much of its present advancement.

Frond, rose-red, filamentous; filaments articulated throughout, mostly dichotomous; ramuli, single-tubed, often whorled; dissepiments, hyaline."

HARVEY.

Fructification double: 1, clustered *capsules;* 2, roundish, gelatinous *receptacles*, containing minute granules.

GRIFFITHSIA EQUISITIFOLIA.—EQUISETUM-LIKE GRIFFITHSIA.

FROND set with short incurved bristle-like ramuli, which gives this plant some resemblance to the Cladostephus verticillatus; but the colour is

different, this being of a red or brownish hue, staining the paper on which it is dried a beautiful pink. On the shores of England, the west of Ireland, and Channel Islands, frequent. Rare in Scotland. Frith of Forth, very rare.

GRIFFITHSIA CORALLINA.—CORALLINE-LIKE GRIFFITHSIA.

This is very unlike the former species; the joints are quite distinct, swollen upwards like the joints of a coralline, and filled with a red liquid, staining the paper on which the plant is preserved of a fine red colour. Found on rocks in the sea, &c. Rare. South of England, not uncommon; Brighton, Weymouth, the Channel Islands. In Falmouth Harbour, plentiful; Hartly, Northumberland, Dublin Bay, Black Rocks, Portrush, Cork Harbour, Belfast Lough.

GRIFFITHSIA SETACEA.—BRISTLY GRIFFITHSIA.

Joints much smaller than in the preceding spe-

cies. Branches slender, irregularly forked, rigid, bare of ramuli. Colour, pinkish ; stains paper of a bright carmine. Rocks and stones in the sea ; not uncommon near low-water mark. Yarmouth, Channel Islands, frequent.

O. S. G. simplicifilum. Branches densely set in whorls, with short straight ramuli. Very rare. On rocks near Black Castle, Wicklow ; and at Ardinairy Point, county Wicklow.

G. multifida. Stems, bristly ; ramuli, two, slender, arising from the joints. On rocks in the sea, rather rare. Frequent on the south coast of England, in many places. Bantry, west of Ireland, Belfast Bay. β. *pilifera*, ramuli very long, sub-simple, and hairlike. Torquay.

G. barbata. Exceedingly rare. On the beach at Brighton.

CALLITHAMNION.

Name meaning a beautiful *shrub*, or *plant*.

"FROND filamentous ; filaments articulated mostly pinnate, one-tubed, dissepiments hyaline."

HARVEY.

Fructification: 1, capsules, "scattered on the ultimate ramuli." 2. *receptacles*, "containing large granules, seated on the main branches."

CALLITHAMNION PLUMULA.—SMALL FEATHERY CALLITHAMNION.

This beautiful little plant, with the help of a small magnifying glass, will be seen set on each side the branches, with small opposite ramuli. The branches are mostly alternate, bearing smaller branchlets. Appearance, when spread in water, delicate and feathery. Colour, rich red. Substance, soft and flaccid. "In the sea, from Orkney to Devon, not uncommon." β. var. Smaller in every part. Coast of Devon and Cornwall. Brighton, Falmouth Harbour, frequent; Caswell Bay, near Swansea.

CALLITHAMNION TETRAGONUM.—SQUARE-BRANCHED CALLITHAMNION.

Branches slender, spreading, alternate, from three to six inches long. Colour, pink, or reddish brown.

Substance, firmer than in the preceding species. Grows on the larger Algæ. I have found it principally on the stems and old fronds of the Laminariæ. Dr. Harvey says it often grows on Codium tomentosum. Not uncommon, Weymouth, Portland. Falmouth, very frequent.

CALLITHAMNION CORYMBOSUM.—CORYMBOSE CALLITHAMNION.

From one to three inches high; this plant, though small, may be distinguished by the naked eye from the other species, by the corymbose, or level-topped, appearance of the branchlets. Colour, rose red. Substance, soft; adheres firmly to paper. Grows on other Algæ. Not uncommon.

CALLITHAMNION TURNERI.—TURNER'S CALLITHAMNION.

Grows in dense tufts about an inch in height; slender, with opposite branches. Colour, a rich red. Grows on other marine Algæ. Common.

There are, besides the four above described, 31 different species in the genus Callithamnion ; all of them extremely elegant little plants, many of them nearly resembling each other, and hardly to be correctly distinguished with the naked eye, except by those botanists who are well acquainted with their general outline, appearance, &c., for their specific characters are not observable except under a glass of high power.

SERIES III.

CHLOROSPERMEÆ.

GRASS-GREEN SERIES.

"PLANTS growing in the sea, in fresh water, or in damp situations; either filamentous, membranaceous, or shapeless; either colourless, (or owing to the presence of an internal, granular, sporular mass) of a grass-green, very rarely purple or red colour. Fructification: green or purple sporules, either filling the frond, or collected into sporidia, rarely contained in external capsules."

HARVEY.

MANY of the species comprised in this series are not marine plants, but inhabitants of the fresh-

water pools, or ditches ; others are found in moist situations, on damp ground, rotten wood, and among mosses. The remarkable voluntary action manifested at the period of germination by the spores of the Conferveæ, and of other plants belonging to this series, has excited much attention abroad, where the opinion generally prevails that the spores, on their liberation from the main filament, become animalculæ. Mr. Agardh,* in his account of Conferva ærea, describes the *sporules* as being furnished with a little *beak* or anterior process, distinguishable from the body of the seed by its paler colour ; and he considered that it was on the vibrations of this *beak* that the motion depended. More recently M. Thuret† has discovered that the spores of many among the fresh-water species are furnished with cilia, which vibrate in the same manner as do the cilia of the ciliated Infusoria. The spores of the Conferveæ have been found to possess two cilia, while on those of Chætophora they form a circle, and the spores of Vancheria are completely covered

* See "Manual of British Algæ," Introduction, p. 26.

†See "Botanique," par M. Adrien de Jussieu, p. 461.

with them. Another curious circumstance has been noticed relative to their power of locomotion, which is, that it only occurs about the time of sunrise, and at a later period it entirely ceases. Thus we find plants that are termed of a simple structure and low organization, presenting phenomena which baffle the researches of the scientific enquirer, and leave the naturalist in doubt whether he be observing the motions of an animalcule or those of a plant, but which cannot fail to impress him with the wonderful care and provision shewn for the continuance of these humble weeds, evincing, as they do so clearly and forcibly, that they have been cared for by a good and beneficent Creator, whose eye is over all his works.

CONFERVEÆ.—CONFERVA TRIBE.

"PLANTS growing in the sea, or in fresh water, filamentous, articulate, without defined gelatine."

HARVEY.

ONLY the first genus of this tribe contains any marine species, the six other genera are exclusively

fresh-water plants. Even in the Conferva twenty-two kinds are inhabitants of fresh-water pools ; two species, C. rivularis and C. capillaris, may frequently be met with in such situations ; the thirty-nine remaining species inhabit the sea or salt water ditches. The commonest marine Conferva, is C. rupestris, a dark green, rather stiff plant, with hairlike filaments, frequent on rocks and corallines.

CONFERVA.

Name from *conferruminare*, to consolidate.

"*Filaments* articulated, free, distinct, uniform, simple or branched. *Fruit*, an internal coloured, granular mass (*endochrome*). *Colour*, green, rarely purple."

HARVEY.

CONFERVA RUPESTRIS.—DARK GREEN ROCK CONFERVA.

VERY much and closely branched, rigid. Colour, dark green. Substance harsh, not adhering to paper. Very common, on rocks in the sea.

CONFERVA LÆTEVIRENS.—LIGHT GREEN BUSHY CONFERVA.

"FILAMENTS much branched, bushy, forming fine tufts of a transparent yellow green colour, greyish, and without gloss when dry."

HARVEY.

Grows on rocks and stones in the sea, common.

CONFERVA ALBIDA.—WHITISH CONFERVA.

"FILAMENTS exceedingly slender, flaccid, pale yellow green, (whitish when dry,) forming dense, silky, or somewhat spongy, intricate tufts."

HARVEY.

Fades in the herbarium to a pale yellowish colour, wholly without gloss. Dr. Harvey says by this character it is best marked from its allies. On rocks and Algæ, common.

ULVACEÆ.—THE ULVA TRIBE.

"PLANTS growing in the sea, of a membranaceous

substance, and imperfectly reticulated structure. Frond either a tubular or flat, filiform, or expanded membrane; colourless, or owing to the presence of fructification, of a green or purple (rarely) pinkish colour. Fructification: minute, green or purple granules, scattered through the frond or arranged in fours."

HARVEY.

The marine plants comprised in this tribe have remarkably thin fronds, often of an irregular or tubular shape, and soft membranaceous texture, adhering firmly to paper. Bangia, the only undescribed *marine* genus, contains a few small inconspicuous species, parasitical on other marine plants.

MARINE GENERA OF THE ULVA TRIBE.

Porphyra. "Frond leafy, purple."

Ulva. "Frond leafy, green."

Enteromorpha. "Frond tubular, simple or branched, green."

Note. Only so much of the character of this tribe is given as relates to the marine genera comprised in it.

PORPHYRA.

Name *purple*, from the colour of most of the species in this genus.

Frond plane, exceedingly thin, and (owing to the fructification) of a purple colour. "*Fructification:* 1, scattered *cori* of oval seeds; 2, roundish *granules*, mostly arranged in a quaternate manner, and covering the whole frond."

GREVILLE.

PORPHYRA LACINIATA.—CLEFT PORPHYRA.

THIS and the next species are known under the name of Laver in England; Sloke, or Slokaun, in Scotland and Ireland. The fronds, after being well boiled, are brought to table, and eaten with meat as a vegetable, and are much liked by many people. This species has the frond very much and irregularly cleft, of a rich purple colour; often fixed by the centre to rocks. When dry, appears of a glossy purple. Very common, on rocks and stones, in the sea.

PORPHYRA VULGARIS.—UNDIVIDED PORPHYRA.

Frond narrow, much waved. Grows with the preceding; and does not differ from it, except that its fronds are undivided.

O. S. P. linearis. Sidmouth; Dunmore, near Waterford; Miltoun Malbay.

P. miniata. Frond, rose red. Only once found at Appin, in Scotland.

ULVA.

Name supposed to be from *Ul*, water, in Celtic.

"*Frond* membranaceous, of a green colour, plane (in some cases saccate, and inflated in the young state). *Fructification:* minute *granules*, mostly arranged in fours."

Harvey.

ULVA LATISSIMA.—WIDE ULVA "GREEN SLOKE."

Frond broadly egg-shaped or oblong, variously cleft and waved. Colour, a full green. Grows in

ULVA LACTUCA *p.115.*

W.Dickes del

the sea. On rocks and corallines, very frequent. Often eaten when cooked in the same manner as the Laver.

ULVA LACTUCA.—LETTUCE ULVA. "OYSTER GREEN."

Frond, when young, like a round bag; then bursting and tearing into many different shaped segments. "A smaller and far more tender plant than the preceding, of a pale yellow green colour."

Harvey.

On rocks and stones in the sea, not uncommon.

O. S. U. Linza. Rocks and stones in the sea.

U. bullosa. Fresh-water Laver. Very like U. Lactuca, formed in stagnant fresh-water pools and ditches.

There are three other species found in damp situations. One species, U. crispa, is common on damp ground, and thatched roofs.

ENTEROMORPHA.

Name alluding to the form of the frond.

"*Frond* tubular, hollow, membranaceous, of a green colour and reticulated structure."

GREVILLE.

ENTEROMORPHA INTESTINALIS—INTESTINE-LIKE ENTEROMORPHA.

FRONDS at first attached by a small root, afterwards detached and floating, curiously curled and inflated, long and narrow. Colour, fine green. In the sea, and in brackish and fresh-water ditches, very common.

ENTEROMORPHA COMPRESSA.—COMPRESSED ENTEROMORPHA.

THE fronds much narrower towards their base, then winding upwards, not inflated. The branches varying in diameter and length. Colour, pale green. Common on rocks and corallines. Said to be eaten in the Sandwich Isles.

O. S. E. Linkiana. Appin, Scotland.

E. erecta. Torquay; St. Michael's Mount, Cornwall; Appin; Frith of Forth; Bute.

E. clathrata. Brighton; Torquay; Belfast Bay; Appin, Scotland.

E. ramulosa. Bantry Bay, Ireland; Appin, Scotland; Plymouth.

E ? percursa. Appin.

ANALYSIS OF THE GENERA AND SPECIES

CONTAINED

IN THE TRIBES NOT DESCRIBED IN THE PRECEDING PAGES.

SERIES I. MELANOSPERMEÆ.

Lichineæ Tribe contains 1 Genus, Lichina.

Frond flat . . . Lichina pygmæa.
Frond cylindrical . . ——— confinis.

Both are small dark green species, not above half an inch high, growing in patches, like a Lichen, on rocks in or near the sea.

Chordarieæ Tribe, containing the three undermentioned Genera.

1 { Frond tuberous, hollow . Corynephora.
  { Frond filiform 2

2 { Frond, the central part firmly gelatinous. Chordaria.
The centre of the frond loosely gelatinous. Helminthocladia.

CHORDARIA.

Frond filiform, branches slender, like small cords.

Grows on rocks, &c., in the sea.

Chordaria flagelliformis.

HELMINTHOCLADIA.

1 { Frond thick, clumsy, wormlike. Helminthocladia vermicularis.
Frond slender 2

2 { Branches with few ramuli. H. Griffithsiana.
Branches set with numerous ramuli. — virescens.

CORYNEPHORA.

Fronds fleshy, hollow tubers.

Corynephora marina.

A curious plant, something resembling a fungus, of an olive brown colour, and

fleshy substance. Grows abundantly on rocks, corallines, &c. It is almost impossible to preserve so as to retain its natural appearance.

SERIES II. RHODOSPERMEÆ.

Gloiocladeæ Tribe contains three Genera.

1 { Frond solid 2
  { Frond tubular . . Gloiosiphonia.

2 { Frond gelatinous . . Mesogloia.
  { Frond sub-gelatinous . Naccaria.

MESOGLOIA.

1 { Frond slightly branched.
  { Mesogloia multifida.
  { Frond much branched . . . 2

2 { Frond of a rose-red or reddish brown
  { colour 3
  { Frond of a purple red or brownish colour . 4

3 { Branches mostly opposite, colour red or
  { brownish red
  { Mesogloia Hudsoni.
  { Branches mostly alternate. Colour, rose red.
  { Mesogloia coccinea.

4 { Stem with long slender branches.
Mesogloia purpurea.
Branches slender and gelatinous, the articulations beadlike.
Mesogloia ? moniliformis.

GLOIOSIPHONIA.

Frond a tube, ramuli slender.
Gloiosiphonia capillaris.

NACCARIA.

Frond filiform, much branched, thickly set with minute ramuli. Colour, rose red.
Naccaria Wigghii.

Spongiocarpeæ Tribe comprises one single genus, Polyides.

Fructification: consisting of spongy, pinky warts, on the sides of the upper branches. Root an expanded *disk*. Polyides rotundus.

Furcellaricæ Tribe also comprises one single genus, Furcellaria.

Fructification: terminal, swelling into long pod-like *receptacles*.

Root composed of fibres. Furcellaria fastigiata.

The above Plants closely resemble each other in their habit of growth ; but in their fructification and structure they differ greatly. Both Plants are of a purplish colour, becoming much darker in drying, and scarcely adhering to paper. Neither kind is uncommon on rocky shores.

SERIES III. CHLOROSPERMEÆ.

The Siphoneæ Tribe contains but two genera of exclusively Marine Species.

Frond spongy, dark green. Codium.

Frond membranaceous, filiform. Bryopsis.

CODIUM.

1 { Fronds cylindrical, forked, tomentosum.
  { Fronds not cylindrical. . . . 2

2 { Frond a globular, spongy, hollow ball spreading over rocks. Bursa.
  { Frond resembling fragments of bright green velvet . . adhærens.

BRYOPSIS.

Frond not much branched, naked below. plumosa.

Frond slender, very much branched. hypnoides.

GLOSSARY.

The *Frond* is a term which when applied to a sea-weed signifies every part of the plant, excepting the *root;* and occasionally the *stem,* if well developed and distinct from the other portions of the plant, is not included under this term.

In *form* it may be either—

Capillary, slender and hairlike.

Compressed, when flattened laterally.

Constricted, when drawn together, as if tied.

Continuous, without interruption—prolonged.

Cylindrical, round and elongated.

Dichotomous, or forked, when regularly branched or cleft into two.

Filamentous, slender, and thread-like.

Filiform, stringlike—the size of common twine.

Lanceolate, shaped like a lance, narrow, tapering at each end.

Linear, narrow, the same width all along.

Palmate, shaped like the hand, with the fingers expanded.

Pinnatifid, cut transversely into several oblong segments.

Plane, flat, level.

Proliferous, when a second frond arises from the first nearly similar to it.

Saccate, double and hollow, in the form of a bag.

Simple, undivided, consisting of one—unbranched.

Tubular, hollow, round like a tube.

In *substance* the Frond is—

Cartilaginous, stiff and gristly.

Coriaceous, when leathery and tough.

Flaccid, soft, when collapsing on removal from the water.

Gelatinous, jellylike, consisting of gelatine.

Rigid, harsh, not collapsing on removal from the water.

The *structure* is termed

Cellular, when composed of small cells.

Filamentous, when formed of fine threads.

Gelatinoso-cartilaginous, between gelatinous and cartilaginous.

Gelatinoso-membranaceous, between gelatinous and membranaceous.

Reticulated, when veined like net-work.

The lesser divisions of the Frond are called ramuli.

These are often spinelike, hairlike, and bristle-like, sometimes.

Articulate, when jointed and furnished with distinct articulations.

Byssoid, when arising in dense, slender tufts.

Corymbose, or level-topped, when the ramuli are of different lengths, but arise to nearly the same level.

Distichous, arising in two opposite rows.

Imbricated, tiled, lapping over each other.

Inarticulate, not jointed, without articulations.

Incurved, bent inwards.

Multifid, many tipped.

Pectinate, with the divisions pointing one way, like the teeth of a comb.

Pectinato-pinnate, partaking equally of both the above, and following character :—

Pinnate, winged.

Pencilled, like the finer strokes made by a pencil.

Secund, when the ramuli bear a second series of *simple* ramuli on one side or directed to one side.

Verticillate, whorled, when set in a circle round the stem or frond.

Terms employed in describing the fructification *of the Algæ, the* seeds *of which consist of either* sporules *or* granules.

The former, for distinction, are termed *primary* seeds ; and are generally placed in *capsules*. The *granules*, or *secondary* seeds, are either collected in *sori* on the fronds, or placed in proper *receptacles*.

Capsules, small pitcher-shaped bodies, containing the *sporules*.

Sori, scattered or defined patches, in which the granules are collected.

Receptacles, variously shaped bodies, containing the seeds.

Sporidia, compact clusters of sporules.

Endochrome, the dark coloured granular or semi-fluid mass that forms the seed of the Algæ.

Sporaceous, of a *spore* or *seedlike* nature.

Granular, consisting of granules.

Sporular, containing sporules.

Tubercles, "small and nearly solid bodies, often composed of minute fibres, among which the seeds lie."

Turgid, swelled.

Immersed (seeds), when sunk in the surface of the frond.

Imbedded (seeds), when situated between the coats of the frond.

Involucre, a small covering.

Ternate, arranged in threes.

Quaternate, arranged in fours.

Free-seeds, when unattached.

Cilia, very minute hairlike bodies, which proceed

from different parts of the *spores* of many of the lower Algæ.

Explanation of various Technical Terms not comprised in the foregoing.

Aggregate, collected or grouped together.

Cellule, a small cell.

Deciduous, falling off.

Disk, surface of a frond within the margin.

Disk, the small base by which many of the Algæ adhere to rocks and other substances.

Dissepiments, the partitions of the articulate Algæ.

Flexuous, wavy.

Frondlet, a small frond.

Globule, a small round body.

Hyaline, clear, glassy, the reverse of opaque.

Laciniated, when the divisions of a frond appear as if cut or torn.

Lateral, at the sides.

Midrib, a large vein, which is termed *percurrent* when continuing through the whole length of the frond; *imperfect* when only partly occurring; and *obsolete* when wearing away.

Nerve, a faint vein.

Opaque, not transparent.

Ovate, egg-shaped.

Pinnæ, the small winged leaflets or portions of a frond.

Punctiform, dot-like.

Scutate, shaped like a shield.

Segments, divisions of the frond.

Septa, bands, partitions.

Striæ, streaks, marks.

Sub, prefixed to a word means that the character does not strictly apply; as, sub-sphærical, not quite sphere-shaped: sub-simple, not entirely simple.

Terminal, at the end.

DIRECTIONS

FOR COLLECTING, LAYING DOWN, AND PRESERVING SEA-WEEDS.

In collecting Sea-weeds, be careful to gather those either growing in the pools left by the tide, or that have been recently thrown up by the sea; for if they be exposed to the sun and air, they soon decompose, and lose their colour. The best time for procuring Sea-weeds is at the very low tides, when many of the rarer species may be found. For carrying them in, use either a basket lined with oil-skin, or a bag of that material. Many of the delicate Florideæ and Ceramieæ require the greatest care, and must be laid out as soon as possible; first ascertaining by the help of a small magnifying glass, or, better still, a microscope, whether the plant is in fruit; and if so, whether it is *capsular* or *granular*. The laying down process is done in this manner:—First wash the Sea-weed in fresh water; then take a plate or dish, cut your paper to the size required, place it in the plate with fresh water, and spread out the plant with a good sized camel-hair pencil in a natural form, (picking out with a pin gives the Sea-weed an unnatural appearance, and destroys the characteristic fall of the branches, which should be carefully avoided;) then gently raise the paper with the specimen out of the

water, placing it in a slanting position for a few moments, so as to allow the superabundant water to run off: after which, place it in the press. The press is made with either three pieces of board, or paste-board. Lay on the first board two sheets of blotting paper; on that lay your specimens; place straight and smooth over them a piece of *old* muslin, fine cambric, or linen; then some more blotting paper, and place another board on top of that, and continue in the same way. The blotting paper and muslin should be carefully removed, and dried every day, and then replaced; at the same time those specimens that are sufficiently dried may be taken away. Nothing now remains but to write on each the name, date, and locality. You can either gum the specimens in a scrap book, or fix them in, as drawings are often fastened, by making four slits in the page, and inserting each corner. This is by far the best plan, as it admits of their removal, without injury to the page, at any future period, if it should be required either to insert better specimens, or intermediate species. Some of the larger Algæ will not adhere to paper, and consequently require gumming. The following method of preserving them has been communicated to me by a botanical friend:—"After well cleaning and pressing, brush the coarser kinds of Algæ over with spirits of turpentine, in which two or three small lumps of gum mastic have been dissolved, by shaking in a warm place; two-thirds of a small phial is the proper proportion, and this will make the specimens retain a fresh appearance."

It will be seen, from the foregoing directions, that a collection of Sea-weeds may be formed with very little trouble. Unlike

flowers, whose beauty entirely disappears when dried, Sea-weeds retain their varied and tender hues unaltered for a length of time. Many of the finer species, from the extreme thinness and delicacy of their substance, present an evenness of surface and a glossy appearance, which often lead persons viewing them for the first time to suppose they are paintings.

"But who can paint
Like Nature? Can imagination boast,
Amidst its gay creation, hues like her's?
Or can it mix them with that matchless skill,
And lose them in each other, as appears
* * * *
In each attractive plant, *that* sucks, and swells
The juicy tide, a twining mass of tubes?"

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